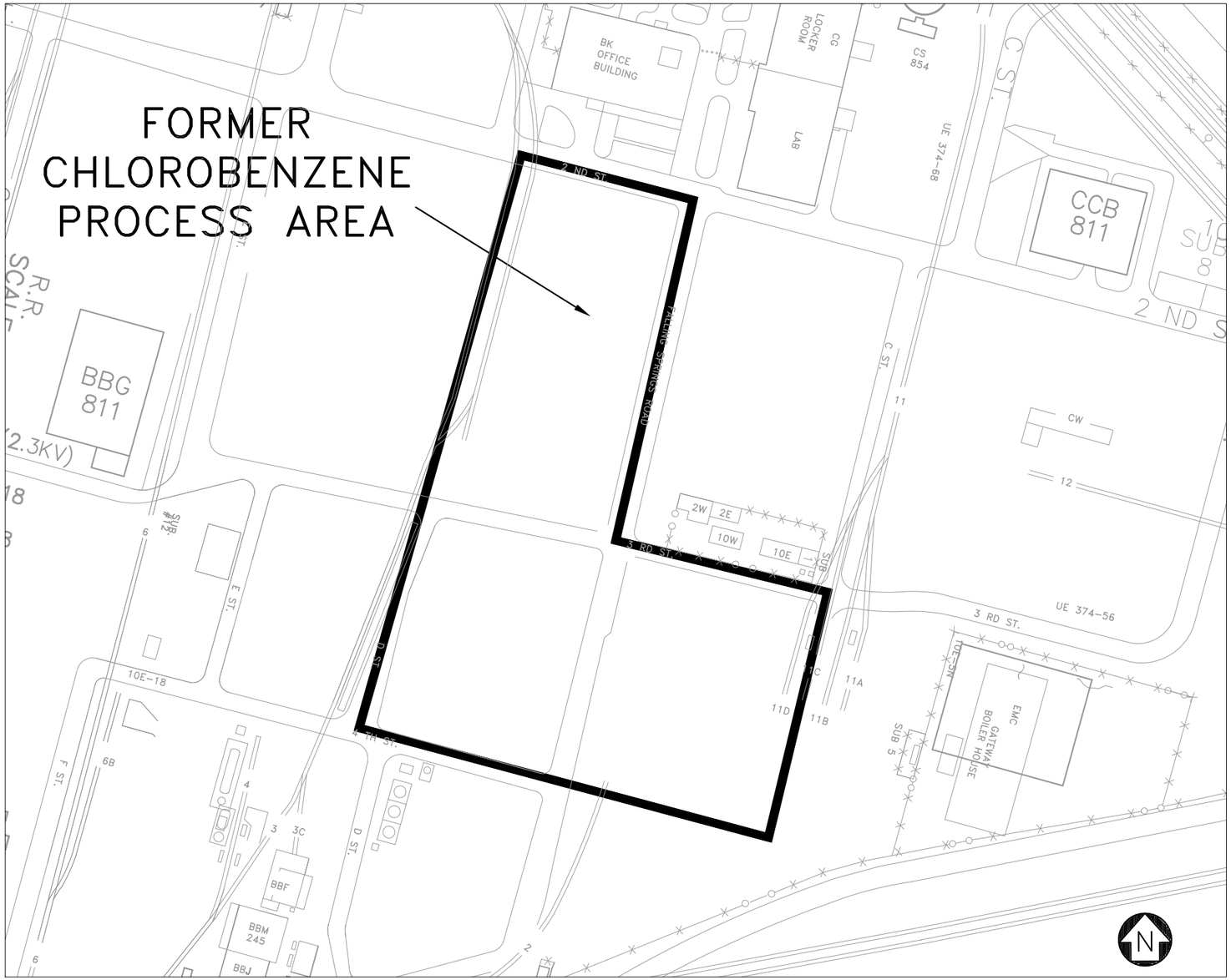
FIGURES

FULL – SCALE THERMALLY ENHANCED SOIL VAPOR EXTRACTION SYSTEM

W.G. KRUMMRICH FACILITY – SAUGET, IL



DRAWING NO.	DRAWING TITLE
FIGURE 1	SITE PLAN & DRAWING INDEX
FIGURE 2	T–SVE TREATMENT AREA
FIGURE 3	GEOLOGICAL CROSS–SECTION A–A'
FIGURE 4	GEOLOGICAL CROSS–SECTION B–B'
FIGURE 5	GEOLOGICAL CROSS–SECTION C–C'
FIGURE 6	SVE/AI SYSTEM PROCESS FLOW DIAGRAM
FIGURE 7	T–SVE WELL LOCATIONS
FIGURE 8	T–SVE WELL CONSTRUCTION DIAGRAM
FIGURE 9	VAPOR PROBE CONSTRUCTION DIAGRAM
FIGURE 10	SVE PIPING LAYOUT
FIGURE 11	AI PIPING LAYOUT
FIGURE 12	PIPE SUPPORTS
FIGURE 13	EXPANSION JOINTS/FLEX JOINTS
FIGURE 14	CLEANOUTS AND SUMPS
FIGURE 15	STEAM TRAPS/CONDENSATE DETAILS
FIGURE 16	SVE AND SVE/AI WELLHEAD DETAILS
FIGURE 17	PIPING HEAT TRACE
FIGURE 18	SVE PIPING AND INSTRUMENTATION DIAGRAM
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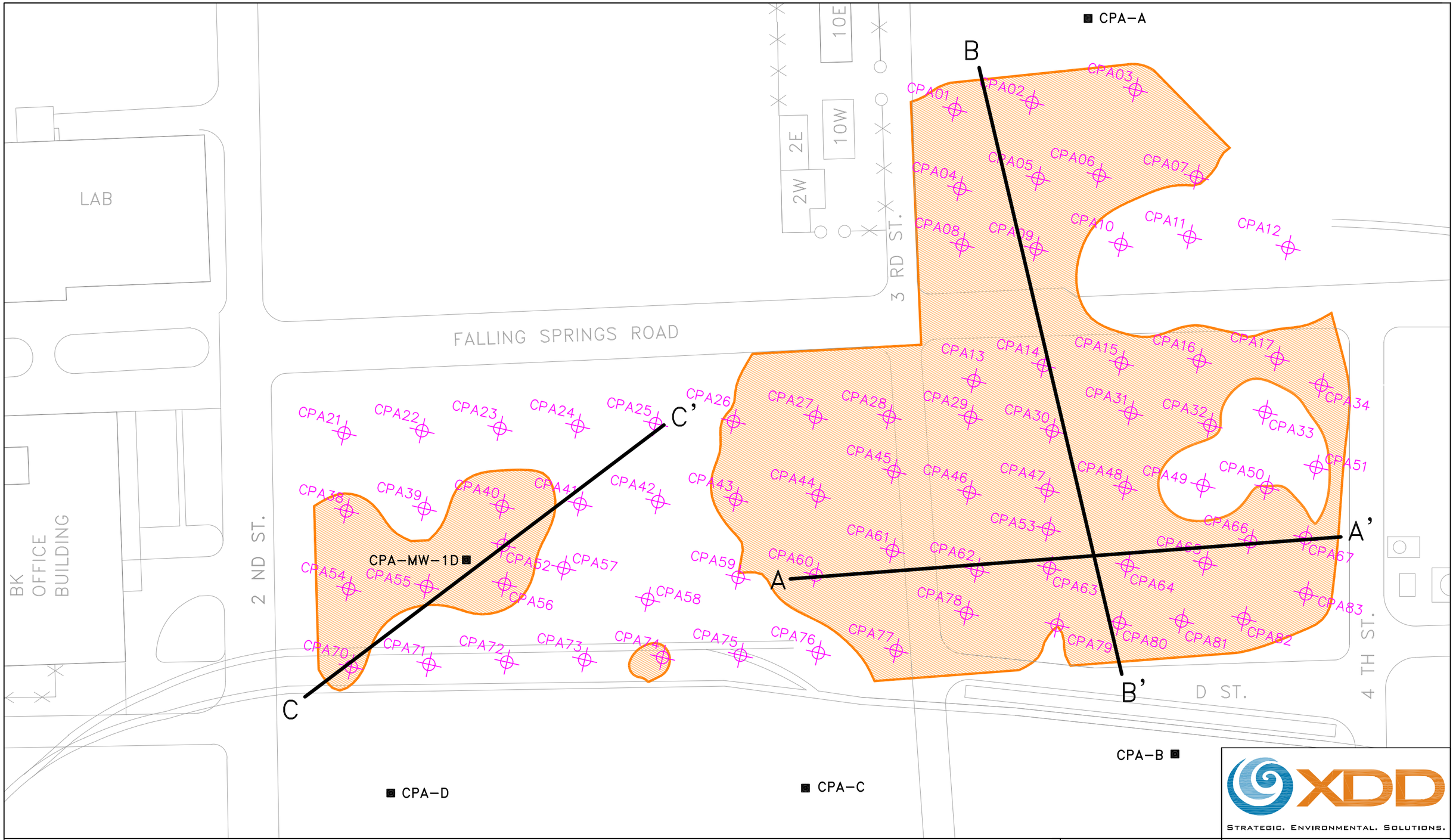
FIGURE 20	ELECTRICAL DETAILS – SENSORS & INTERLOCKS WIRING
FIGURE 21	TEMPERATURE PROBE AND WATER LEVEL TRANSDUCER LOCATIONS
FIGURE 22	THERMOX PIPING AND INSTRUMENTATION DIAGRAM
FIGURE 23	ACID GAS SCRUBBER PIPING AND INSTRUMENTATION DIAGRAM
FIGURE 24	EQUIPMENT BUILDING LAYOUT
FIGURE 25	INSULATING CAP
FIGURE 26	ELECTRICAL UTILITIES LAYOUT
FIGURE 27	ELECTRICAL DETAILS – MAIN POWER & SUB–PANEL LAYOUT
FIGURE 28	ELECTRICAL DETAILS – ELECTRICAL LINE DIAGRAM
FIGURE 29	FIRE PROTECTION UTILITIES MAP
FIGURE 30	NATURAL GAS SUPPLY LINE CONNECTION
FIGURE 31	NATURAL GAS SUPPLY LINE DETAILS
FIGURE 32	SEWER DISCHARGE LINE CONNECTION
FIGURE 33	SEWER DISCHARGE LINE DETAILS
FIGURE 34	WATER SUPPLY LINE CONNECTION
FIGURE 35	WATER SUPPLY LINE DETAILS
FIGURE 36	STEAM SUPPLY LINE CONNECTION
FIGURE 37	STEAM SUPPLY LINE DETAILS
FIGURE 38A	CPA DESIGN & CONSTRUCTION SCHEDULE
FIGURE 38B	T–SVE OPERATION SCHEDULE

75' 0' 75' 150'

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: SITE PLAN AND DRAWING INDEX W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: JTH	DRAWING NO.: FIGURE 1
CHECKED BY: ELS	REV: 3
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- EXISTING MONITORING WELL/CLUSTER
- URS SOIL BORING (2009)
- 0–15 FOOT INTERVAL COC EXCEEDANCE AREA
- CROSS–SECTION LOCATIONS (REFER TO FIGURES 3 THROUGH 5)

30' 0' 30' 60'

NOTES:

- COC: CONTAMINANT OF CONCERN
- T–SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION

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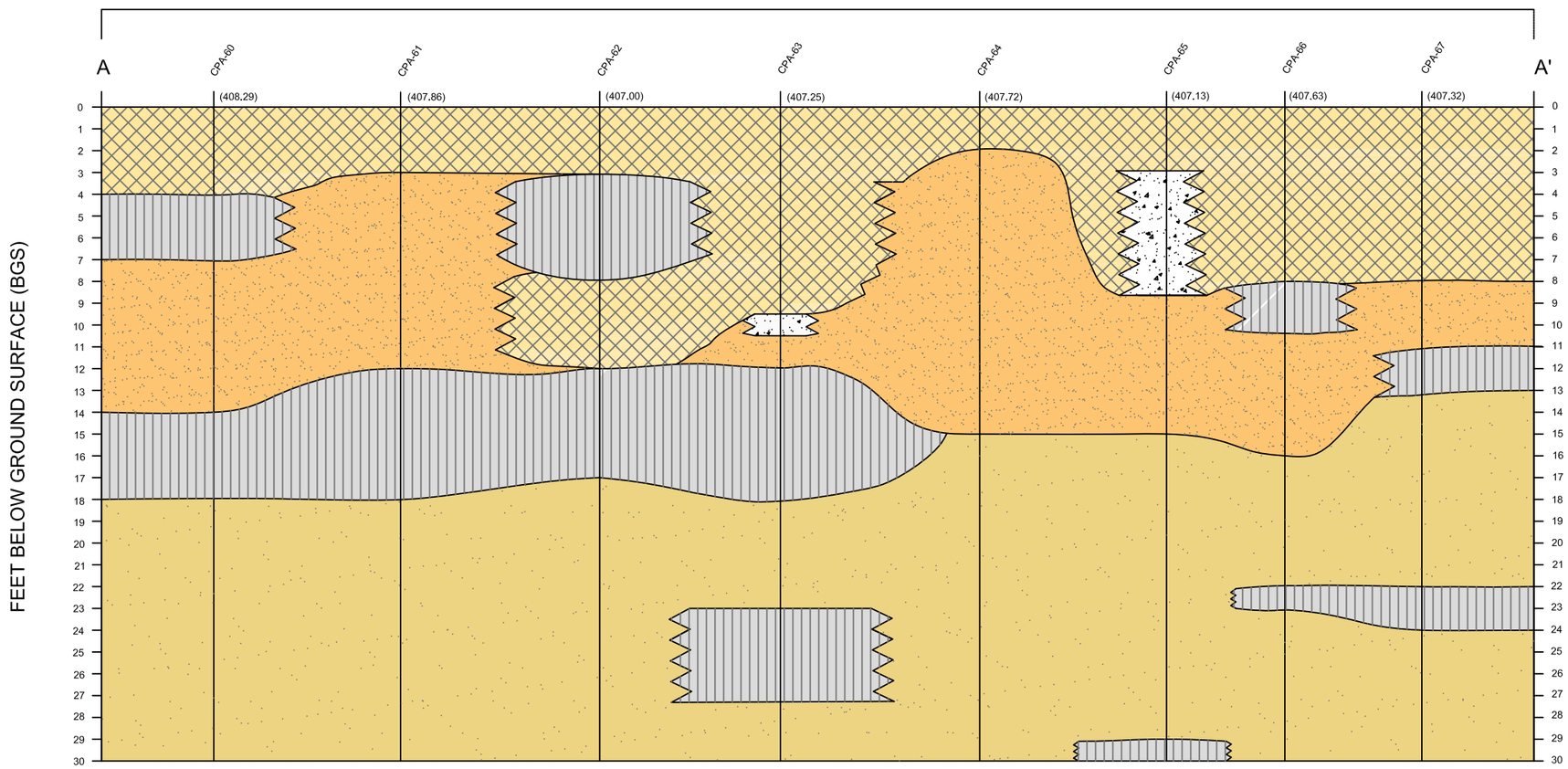
SCALE: AS SHOWN	TITLE: T–SVE TREATMENT AREA W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 2
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	

TREATMENT AREA



LEGEND:

- SANDY FILL/UPPER SILTY SAND LAYER
- SHALLOW HYDROGEOLOGIC UNIT
- INTERMEDIATE SILTY CLAY LAYER
- CONCRETE AND/OR CINDERS
- LOWER SILTY SAND LAYER

20' 0' 20' 40'

HORIZONTAL SCALE

XDD

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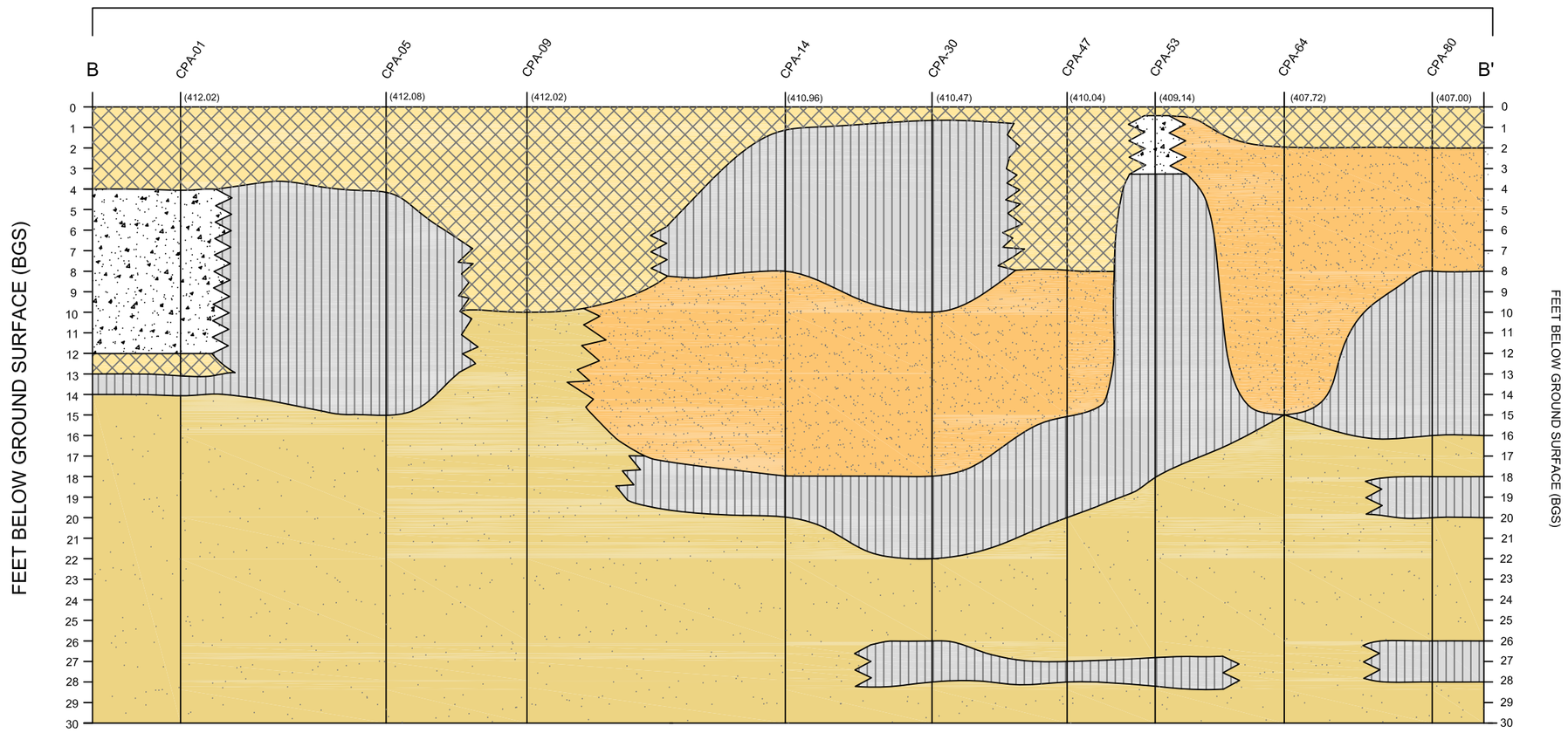
SCALE: AS SHOWN	TITLE: GEOLOGICAL CROSS SECTION A–A' W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: PC	DRAWING NO.: FIGURE 3
CHECKED BY: ELS	REV: 1
PROJ. MGMT. APPROVAL: SC	

TREATMENT AREA



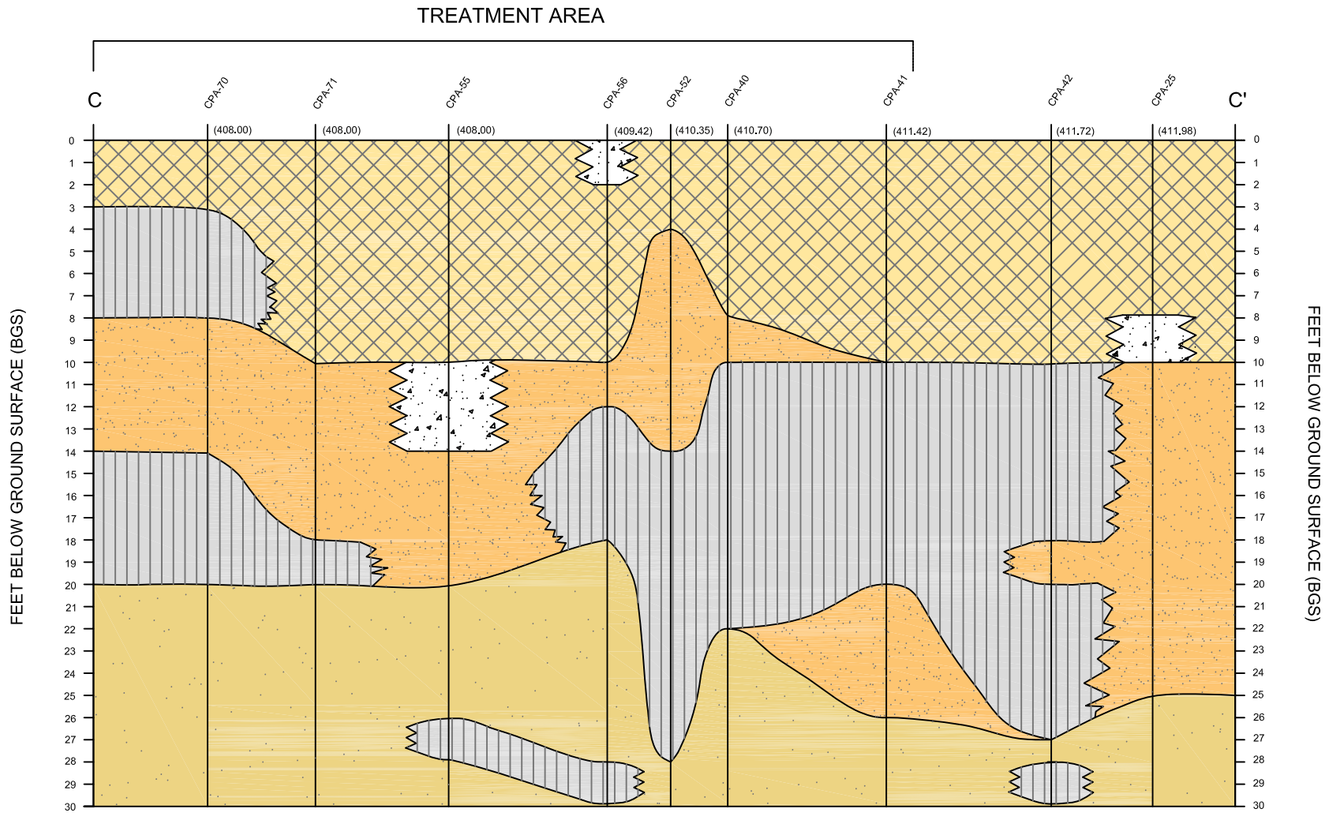
LEGEND:

- SANDY FILL/UPPER SILTY SAND LAYER
- SHALLOW HYDROGEOLOGIC UNIT
- INTERMEDIATE SILTY CLAY LAYER
- CONCRETE AND/OR CINDERS
- LOWER SILTY SAND LAYER

20' 0' 20' 40'
HORIZONTAL SCALE

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: GEOLOGICAL CROSS-SECTION B-B' W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: PC	DRAWING NO.: FIGURE 4
CHECKED BY: ELS	REV: 2
PROJ. MGMT. APPROVAL: SC	



LEGEND:

- SANDY FILL/UPPER SILTY SAND LAYER
- SHALLOW HYDROGEOLOGIC UNIT
- INTERMEDIATE SILTY CLAY LAYER
- CONCRETE AND/OR CINDERS
- LOWER SILTY SAND LAYER

20' 0' 20' 40'

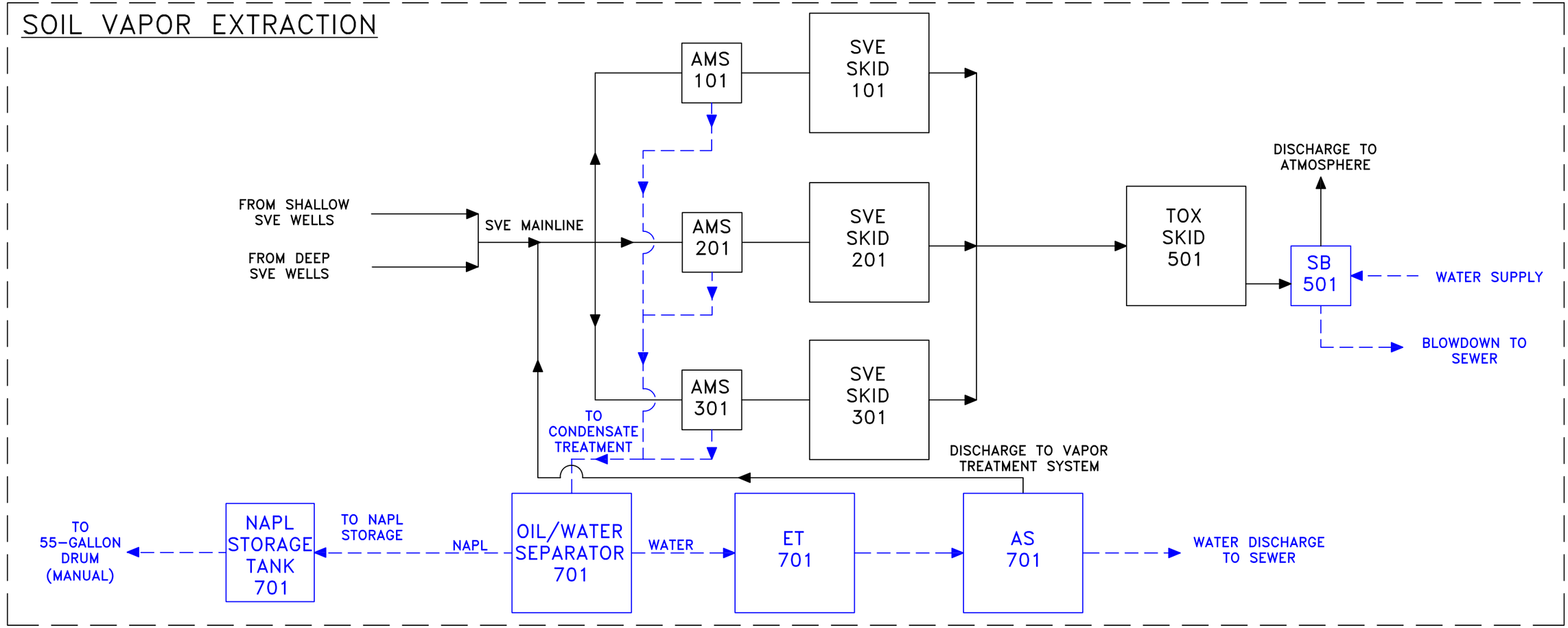
HORIZONTAL SCALE

XDD

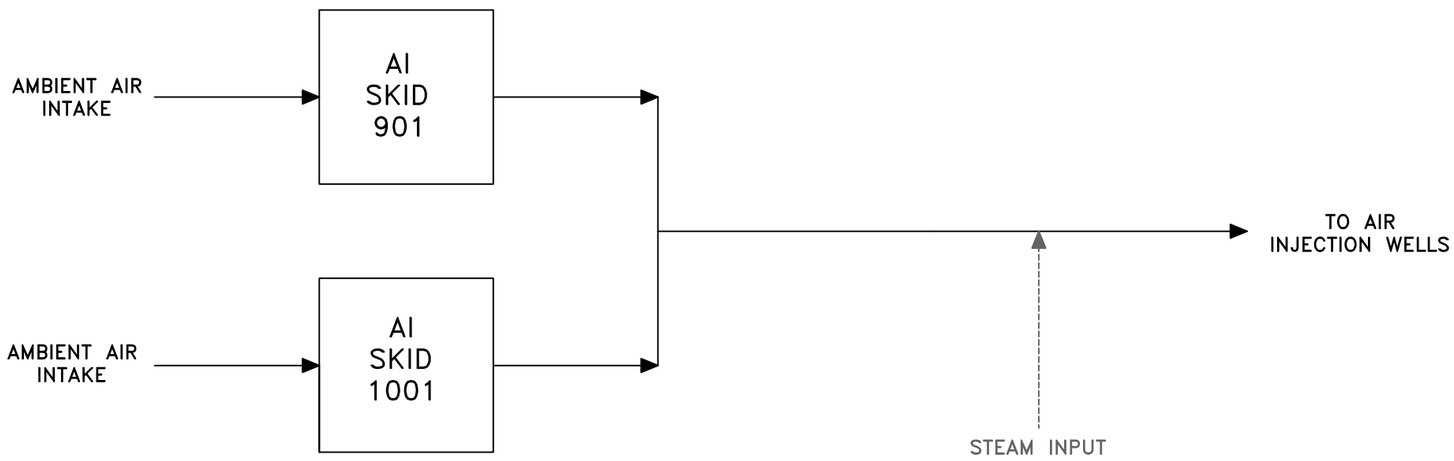
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: GEOLOGICAL CROSS-SECTION C-C' W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: PC	DRAWING NO.: FIGURE 5
CHECKED BY: ELS	REV: 2
PROJ. MGMT. APPROVAL: SC	

SOIL VAPOR EXTRACTION



AIR INJECTION



LEGEND:

- AIR FLOW DIRECTION
- WATER FLOW DIRECTION
- STEAM FLOW DIRECTION

NOTES:

AMS	Air Moisture Separator
AI	Air Injection
AS	Air Stripper
ET	Equalization Tank
HE	Heat Exchanger
NAPL	Non-Aqueous Phase Liquid
SB	Acid-Gas Scrubber
SVE	Soil Vapor Extraction
TOX	Thermal Oxidizer

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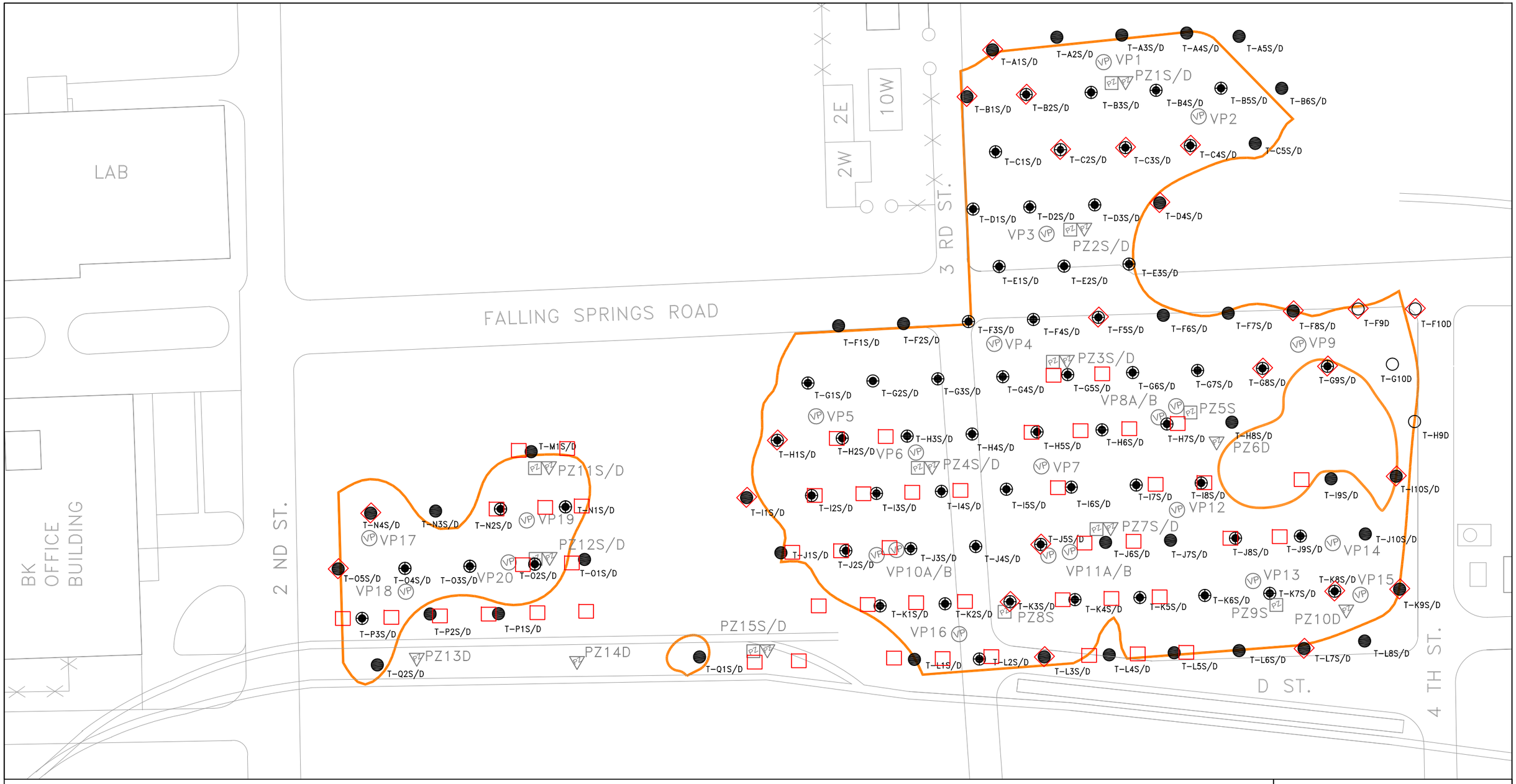
SCALE: NOT TO SCALE	TITLE: SVE/AI PROCESS FLOW DIAGRAM W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: ELS	DRAWING NO.: FIGURE 6
CHECKED BY: DK	REV: 2
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- T-SVE COMBINATION SHALLOW AND DEEP WELL LOCATION
- T-SVE DEEP WELL LOCATION
- AIR INJECTION WELL LOCATION
- SHALLOW AND DEEP NESTED VAPOR PROBE LOCATION
- SHALLOW PIEZOMETER LOCATION
- DEEP PIEZOMETER LOCATION
- PRE-BORING (EABR) LOCATION TO CONFIRM GEOLOGY PRIOR TO EABR WELL INSTALLATION
- ADDITIONAL BORING LOCATION TO CONFIRM GEOLOGY PRIOR TO T-SVE WELL INSTALLATION
- 0-15 FOOT INTERVAL COC EXCEEDANCE AREA

NOTES:

- COC: CONTAMINANT OF CONCERN
- EABR: ENHANCED AEROBIC BIOREMEDIATION
- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION

30' 0' 30' 60'

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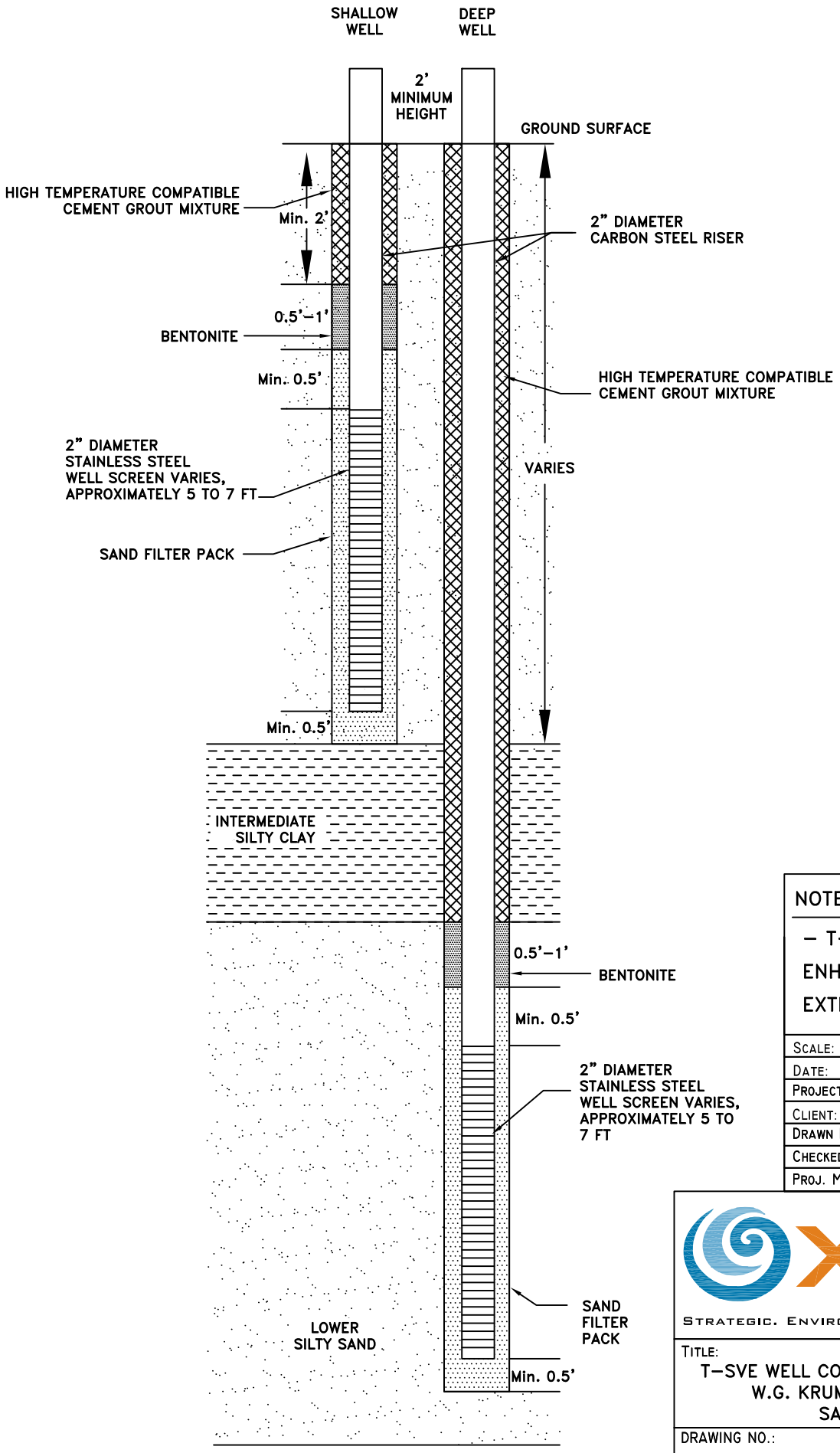
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: T-SVE WELL LOCATIONS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 7
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	

TYPICAL T-SVE/AI WELL



NOTES:

- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION

SCALE:	NOT TO SCALE
DATE:	NOVEMBER 2011
PROJECT NO.:	11003
CLIENT:	SOLUTIA INC.
DRAWN BY:	JTH
CHECKED BY:	ELS
PROJ. MGMT. APPROVAL:	SC

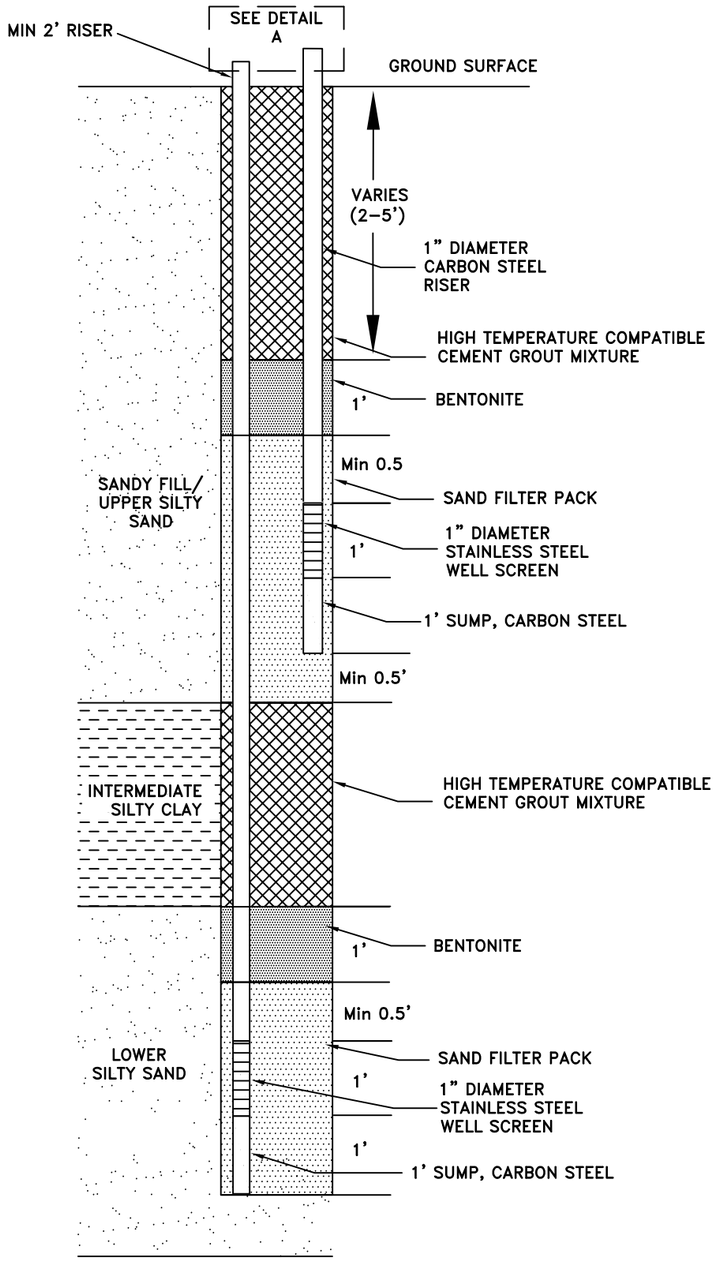
XDD

STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

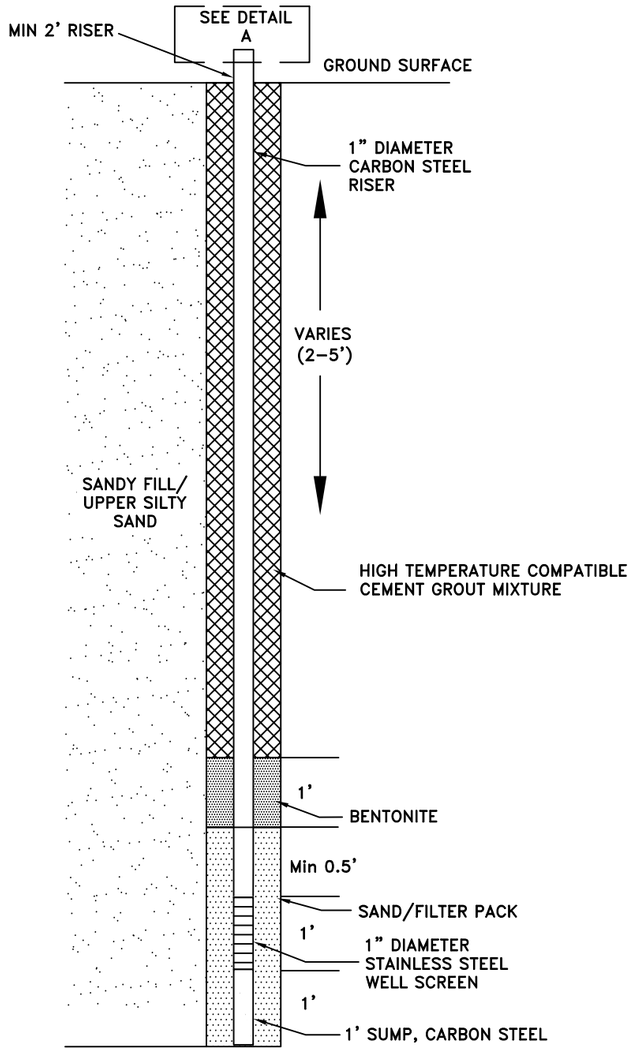
TITLE:
T-SVE WELL CONSTRUCTION DIAGRAM
W.G. KRUMMRICH FACILITY
SAUGET, IL

DRAWING NO.:	REV:
FIGURE 8	1

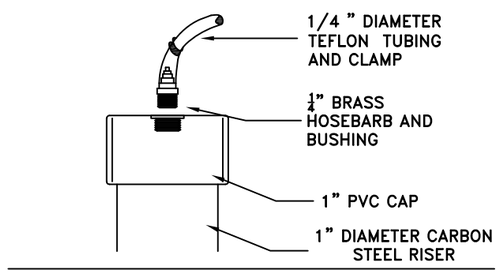
TYPICAL NESTED VAPOR PROBE



TYPICAL SINGLE VAPOR PROBE



TYPICAL VAPOR PROBE PROBE COMPLETION DETAIL A



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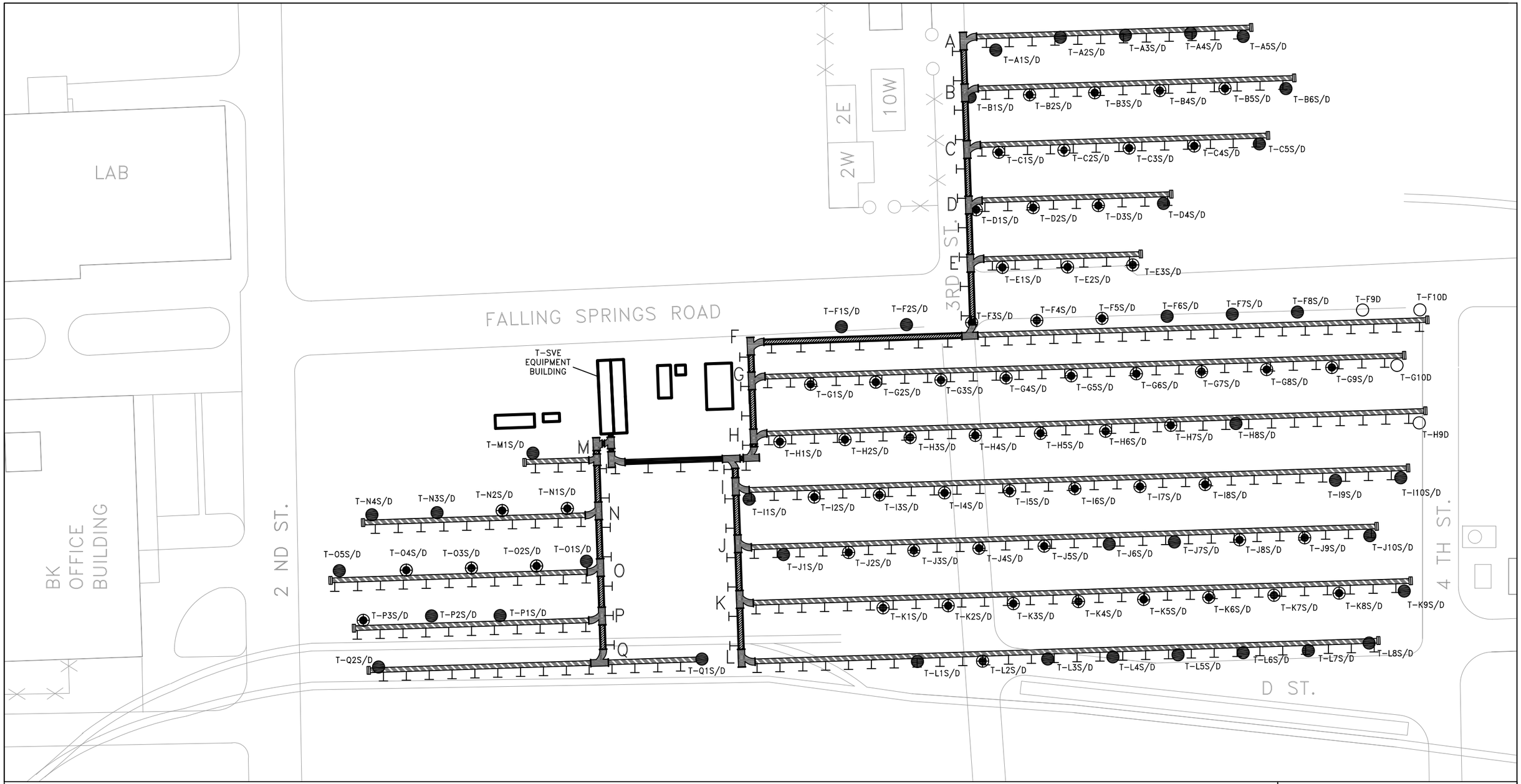
SCALE: NOT TO SCALE	TITLE: VAPOR PROBE CONSTRUCTION DIAGRAM W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: JTH	DRAWING NO.: FIGURE 9
CHECKED BY: ELS	REV: 1
PROJ. MGMT. APPROVAL: SC	



LEGEND:

- COMBINATION SHALLOW AND DEEP SVE WELL LOCATION
- DEEP SVE WELL LOCATION
- SVE/AI WELL LOCATION
- SWEEP TEE
- BLIND FLANGE
- 4-INCH CARBON STEEL PIPING
- 8-INCH CARBON STEEL PIPING
- 12-INCH CARBON STEEL PIPING
- A — LEG IDENTIFICATION LETTER
- PIPE SUPPORT

30' 0' 30' 60'

NOTES:

– T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION

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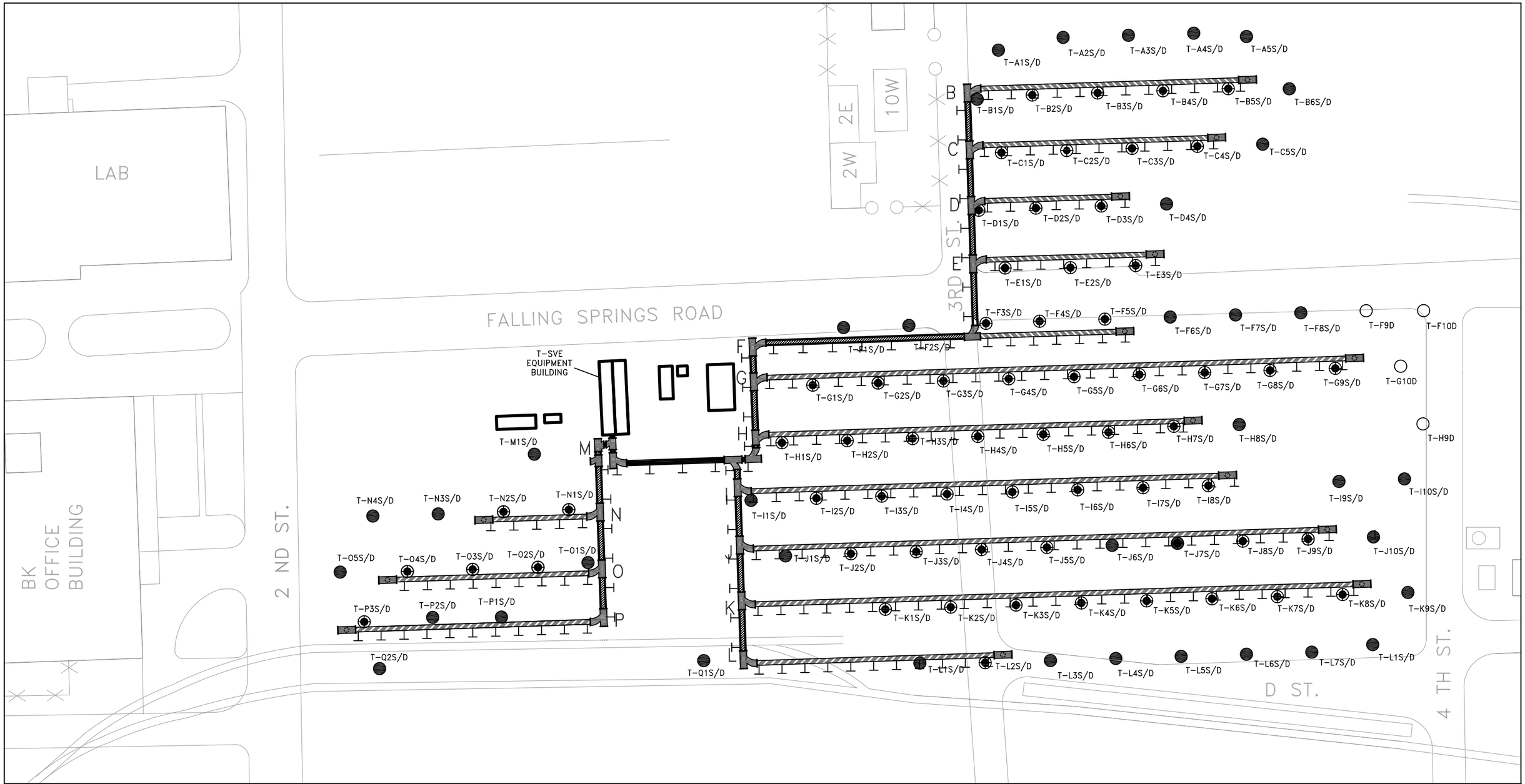
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: SVE PIPING LAYOUT W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 10
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- COMBINATION SHALLOW AND DEEP SVE WELL LOCATION
- DEEP SVE WELL LOCATION
- SVE/AI WELL LOCATION
- SWEEP TEE
- SUMP/CLEANOUT
- 4-INCH CARBON STEEL PIPING
- 8-INCH CARBON STEEL PIPING
- 12-INCH CARBON STEEL PIPING
- A — LEG IDENTIFICATION LETTER
- PIPE SUPPORT

NOTES:

– T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
–AI: AIR INJECTION

30' 0' 30' 60'

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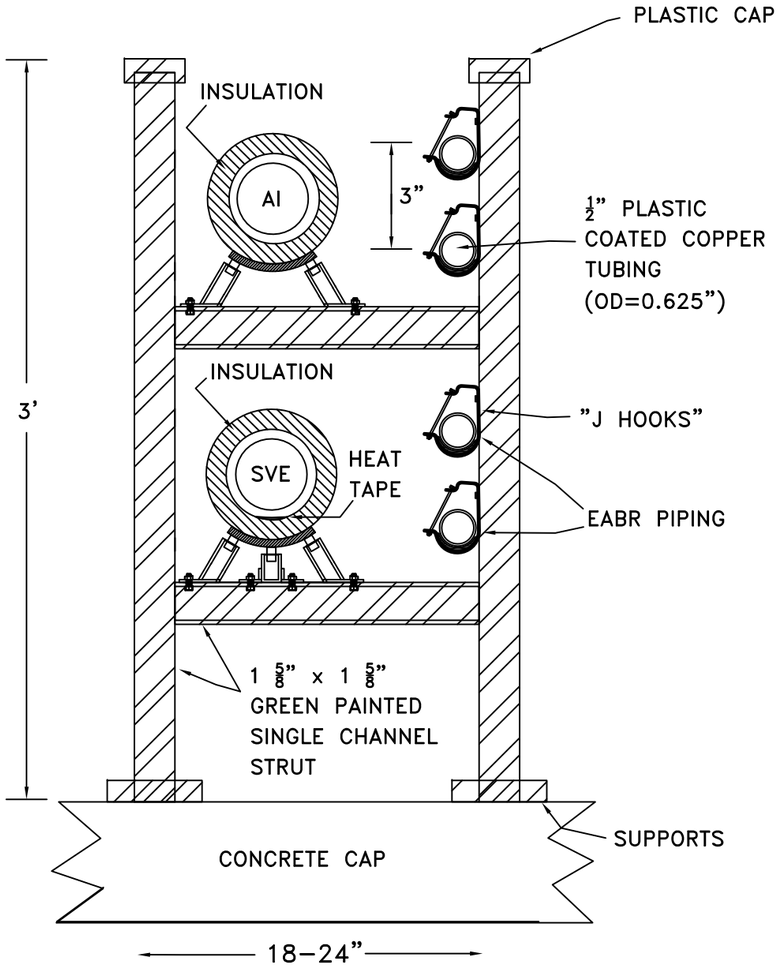
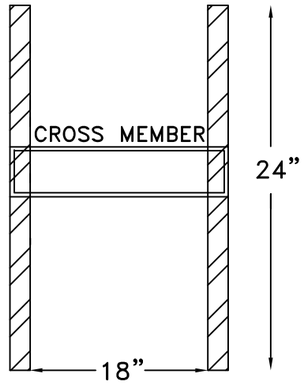
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

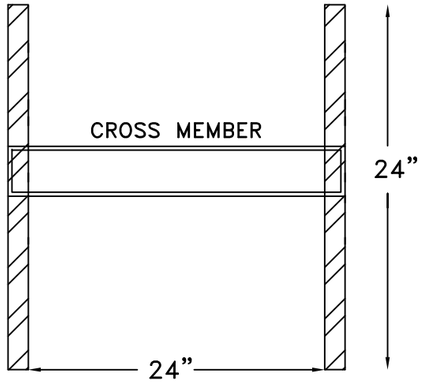
SCALE: AS SHOWN	TITLE: AI PIPING LAYOUT W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 11
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	



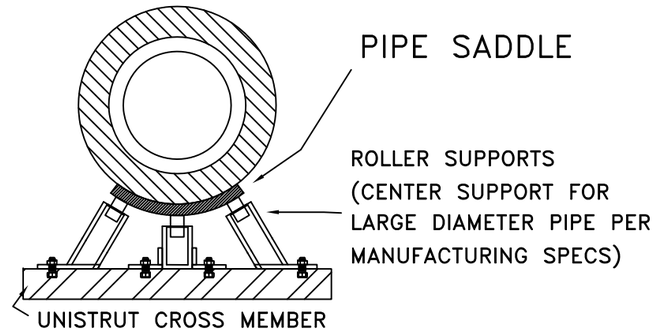
PLAN–VIEW LATERAL

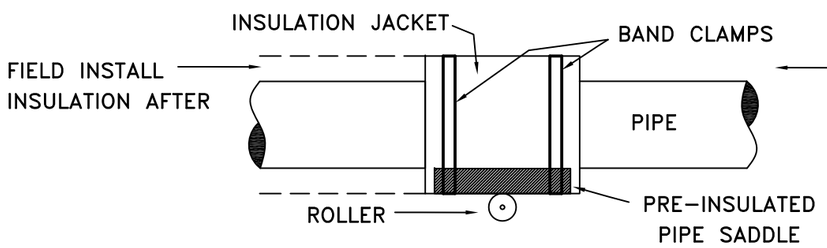


PLAN–VIEW MAINS AND LATERALS



SUPPORT DETAILS





MAY USE PRE–INSULATED PIPE SADDLE AND ROLLER ASSEMBLY FOR INSTALLATION PURPOSES

NOTES:

- AI: AIR INJECTION
- EABR: ENHANCED AEROBIC BIOREMEDIATION
- SVE: SOIL VAPOR EXTRACTION
- OD: OUTER DIAMETER
- ALL WELLHEADS (SVE AND SVE/AI) AND AI MANIFOLD PIPING WILL INSULATED.
- ALL SVE MANIFOLD PIPING WILL BE INSULATED AND HEAT TRACED FOR FREEZE PROTECTION.

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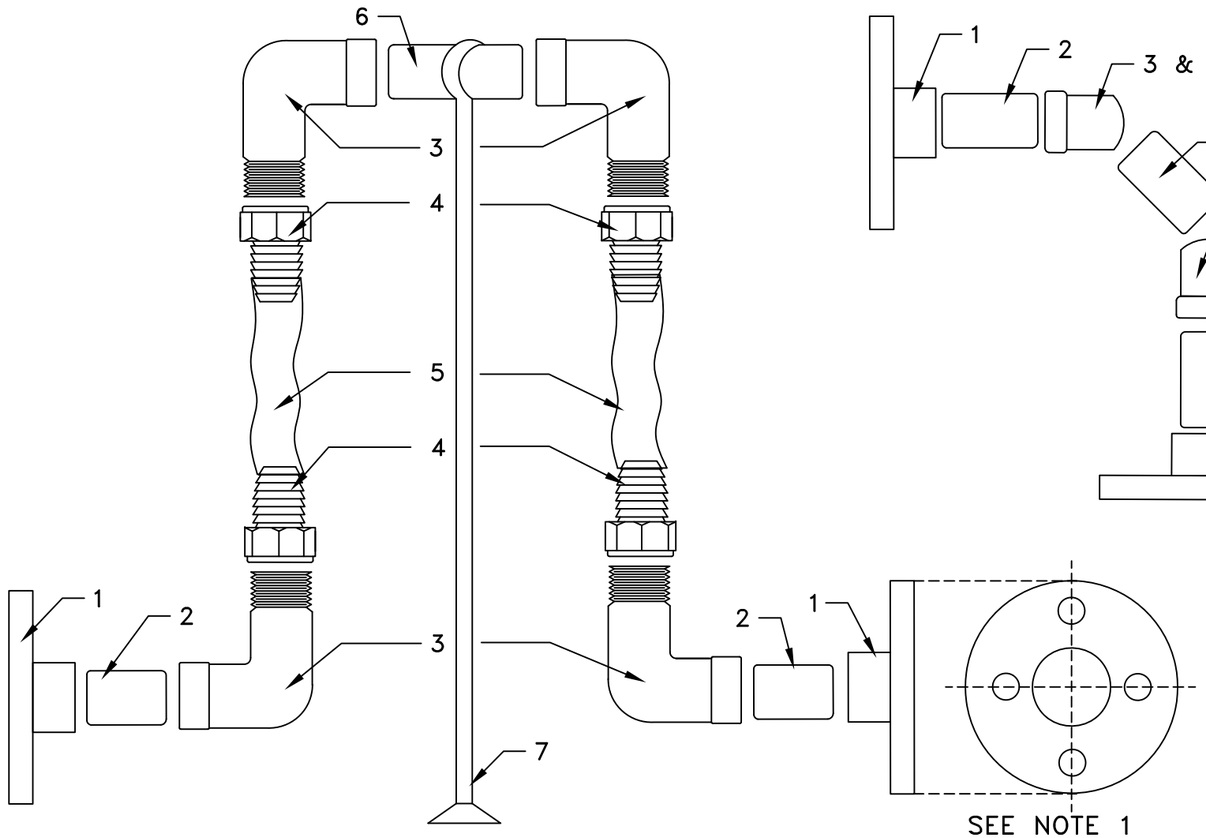
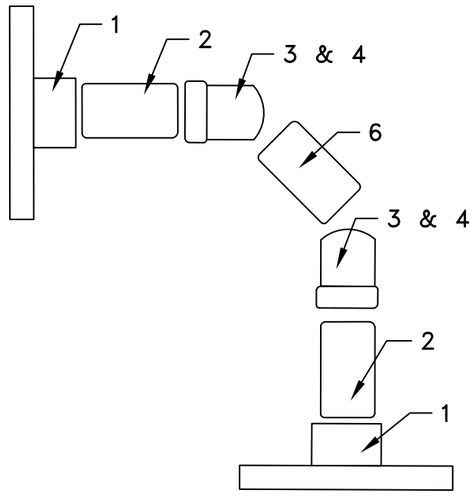
SCALE: NOT TO SCALE	TITLE: PIPE SUPPORTS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA, INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 12
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	

EXPANSION JOINT

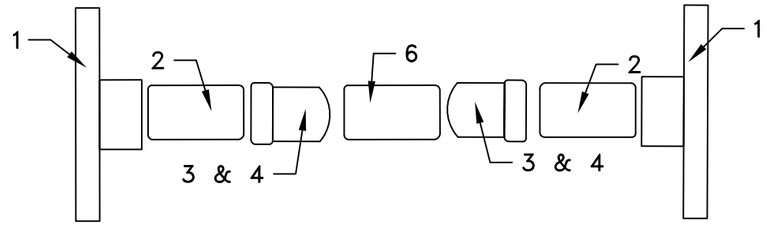
LAYOUT VIEW



PLAN VIEW – 90° ORIENTATION



PLAN VIEW – STRAIGHT ORIENTATION



Item No.	Description
1	BUTT–WELD FLANGE (FITTED WITH FULL–FACE VITON® GASKET WITH BOLT HOLES)
2	SCHEDULE 10 CARBON STEEL
3	SCHEDULE 10 CARBON STEEL EL 90°
4	316SS HOSE BARB ADAPTER
5	WHMWPE/PTFE/XLPE HOSE
6	SCHEDULE 10 CARBON STEEL (3" LENGTH)
7	SUPPORT BRACKET

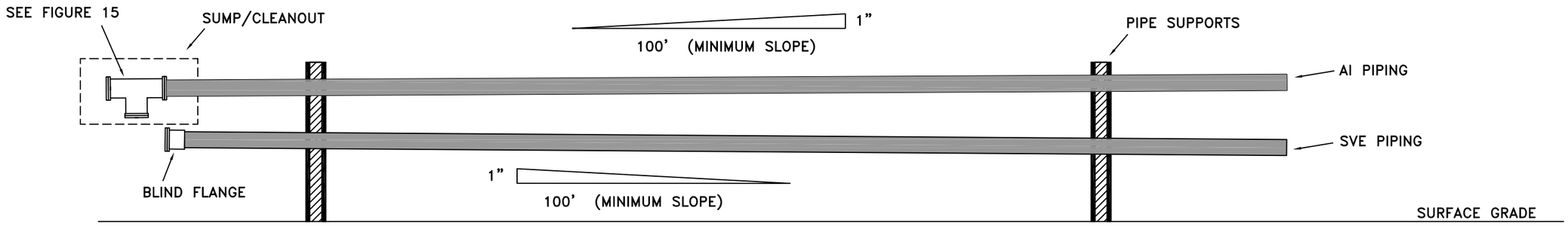
NOTES:

- FLANGE BOLT HOLES WILL BE PROPERLY ALIGNED AND BOLT HOLES WILL BE ORIENTED PERPENDICULAR AND PARALLEL TO GROUND SURFACE.
- HOSES WILL BE FITTED ONTO THE HOSE BARBS USING TWO STAINLESS STEEL HOSE CRIMP CLAMPS AT EACH BARBED HOSE FITTING.

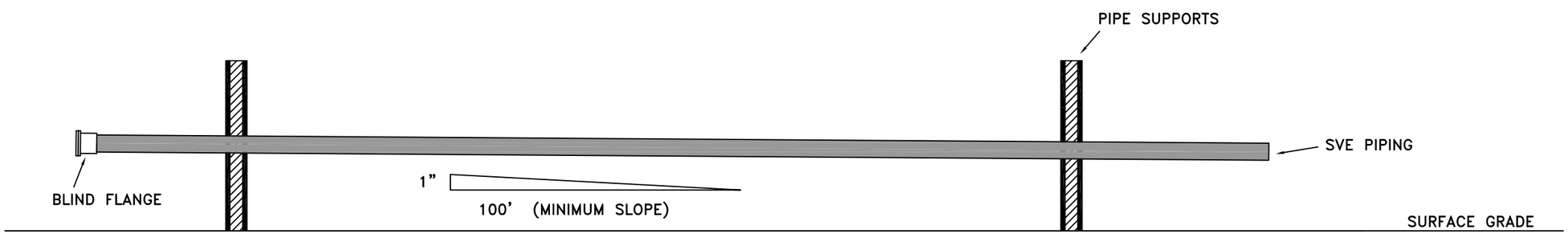
XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: EXPANSION JOINTS/FLEX JOINTS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA, INC.	
DRAWN BY: KJO	DRAWING NO.: FIGURE 13
CHECKED BY: LBC	REV: 1
PROJ. MGMT. APPROVAL: SCC	

LEGS WITH COMBINATION SVE/AI WELLS



LEGS WITH COMBINATION SVE WELLS ONLY

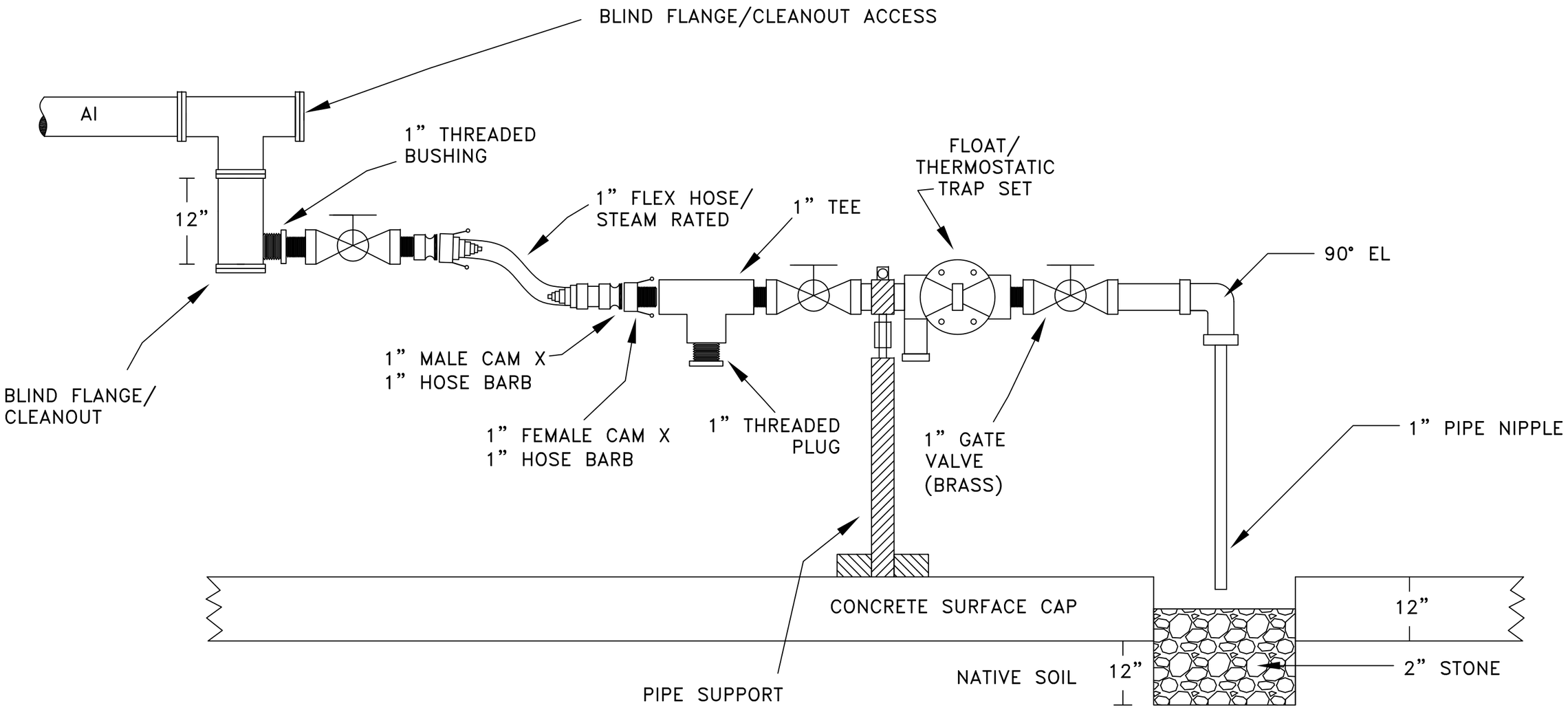


NOTES:

- AI = AIR INJECTION
- SVE = SOIL VAPOR EXTRACTION

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: CLEANOUTS AND SUMPS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC	
DRAWN BY: JTH	DRAWING NO.: FIGURE 14
CHECKED BY: ELS	REV: 2
PROJ. MGMT. APPROVAL: SCC	



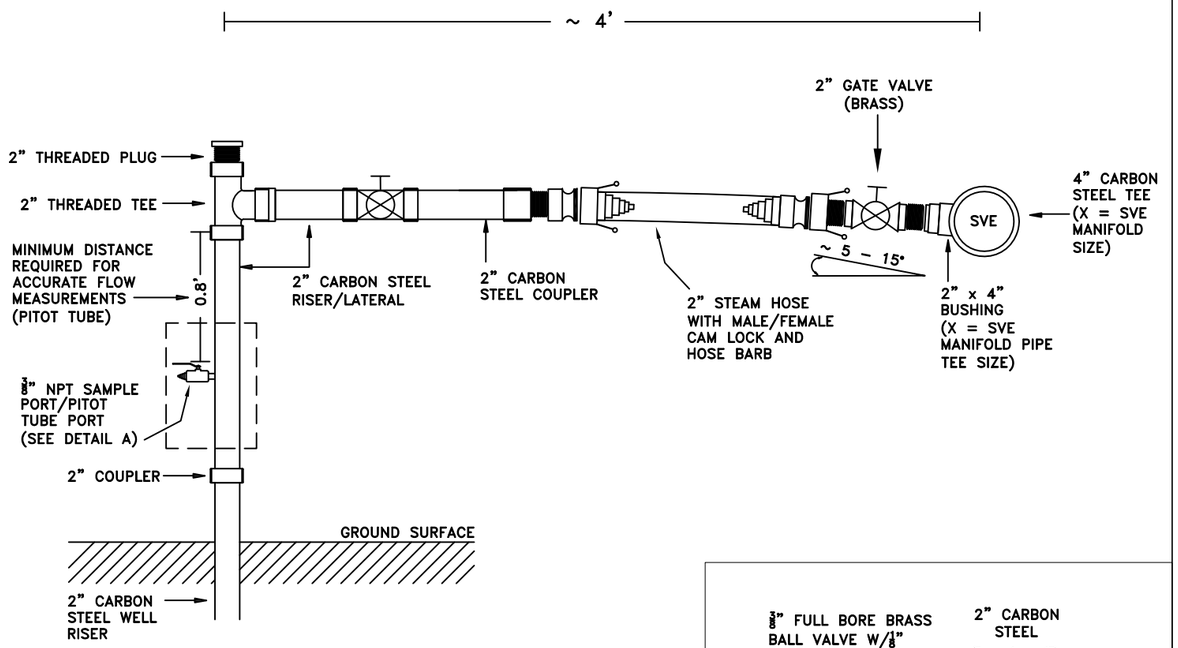
NOTES:

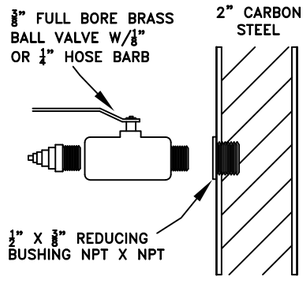
– AI = AIR INJECTION

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: STEAM TRAPS/CONDENSATE MAINS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 15
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	

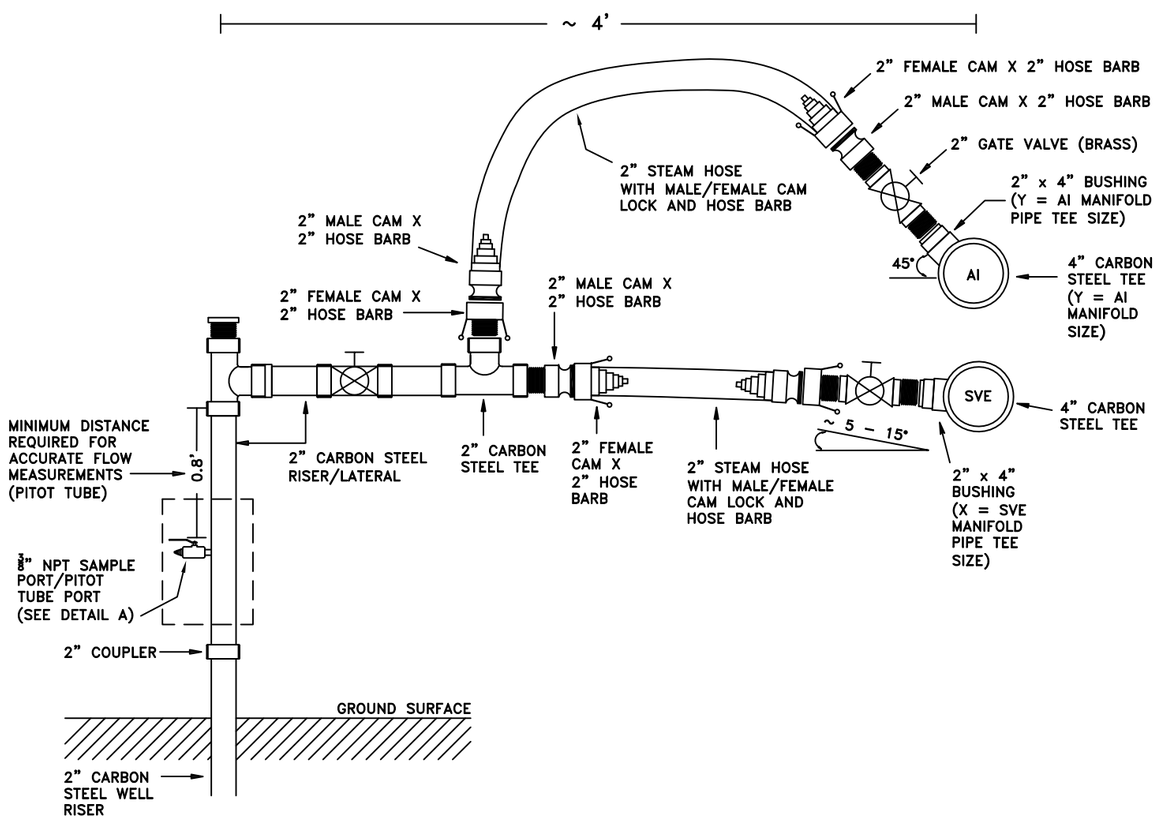
SVE WELLHEAD – SIDEVIEW





DETAIL A

COMBINATION SVE/AI WELLHEAD – SIDEVIEW



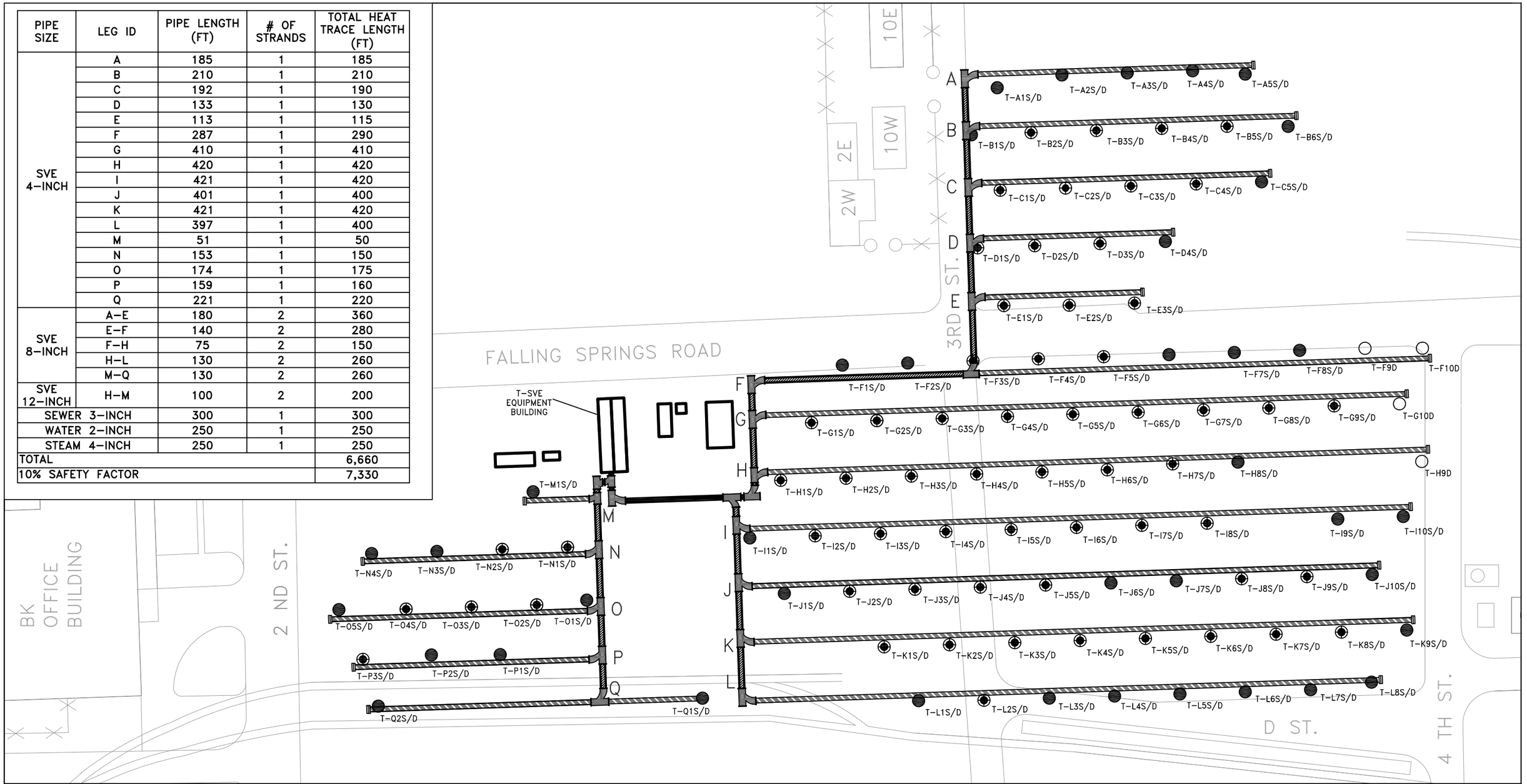
NOTES:

- AI = AIR INJECTION
- SVE = SOIL VAPOR EXTRACTION
- ALL WELLHEAD MATERIALS WILL BE CONSTRUCTED OF SCHEDULE 10 CARBON STEEL (UNLESS NOTED)
- ALL SVE AND COMBINATION SVE/AI WELLHEADS WILL BE INSULATED

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

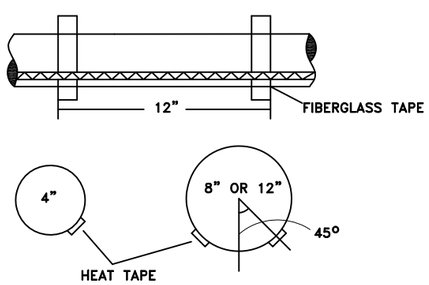
SCALE: NOT TO SCALE	TITLE: SVE AND SVE/AI WELLHEAD DETAILS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: ELS	DRAWING NO.: FIGURE 16
CHECKED BY: ELS	REV: 1
PROJ. MGMT. APPROVAL: SCC	

PIPE SIZE	LEG ID	PIPE LENGTH (FT)	# OF STRANDS	TOTAL HEAT TRACE LENGTH (FT)
SVE 4-INCH	A	185	1	185
	B	210	1	210
	C	192	1	190
	D	133	1	130
	E	113	1	115
	F	287	1	290
	G	410	1	410
	H	420	1	420
	I	421	1	420
	J	401	1	400
	K	421	1	420
	L	397	1	400
	M	51	1	50
	N	153	1	150
	O	174	1	175
	P	159	1	160
	Q	221	1	220
SVE 8-INCH	A-E	180	2	360
	E-F	140	2	280
	F-H	75	2	150
	H-L	130	2	260
	M-Q	130	2	260
SVE 12-INCH	H-M	100	2	200
SEWER 3-INCH		300	1	300
WATER 2-INCH		250	1	250
STEAM 4-INCH		250	1	250
TOTAL				6,660
10% SAFETY FACTOR				7,330



LEGEND:

- COMBINATION SHALLOW AND DEEP SVE WELL LOCATION
- DEEP SVE WELL LOCATION
- SVE/AI WELL LOCATION
- SWEEP TEE
- BLIND FLANGE
- 4-INCH CARBON STEEL PIPING
- 8-INCH CARBON STEEL PIPING
- 12-INCH CARBON STEEL PIPING
- A — LEG IDENTIFICATION LETTER



NOTES:

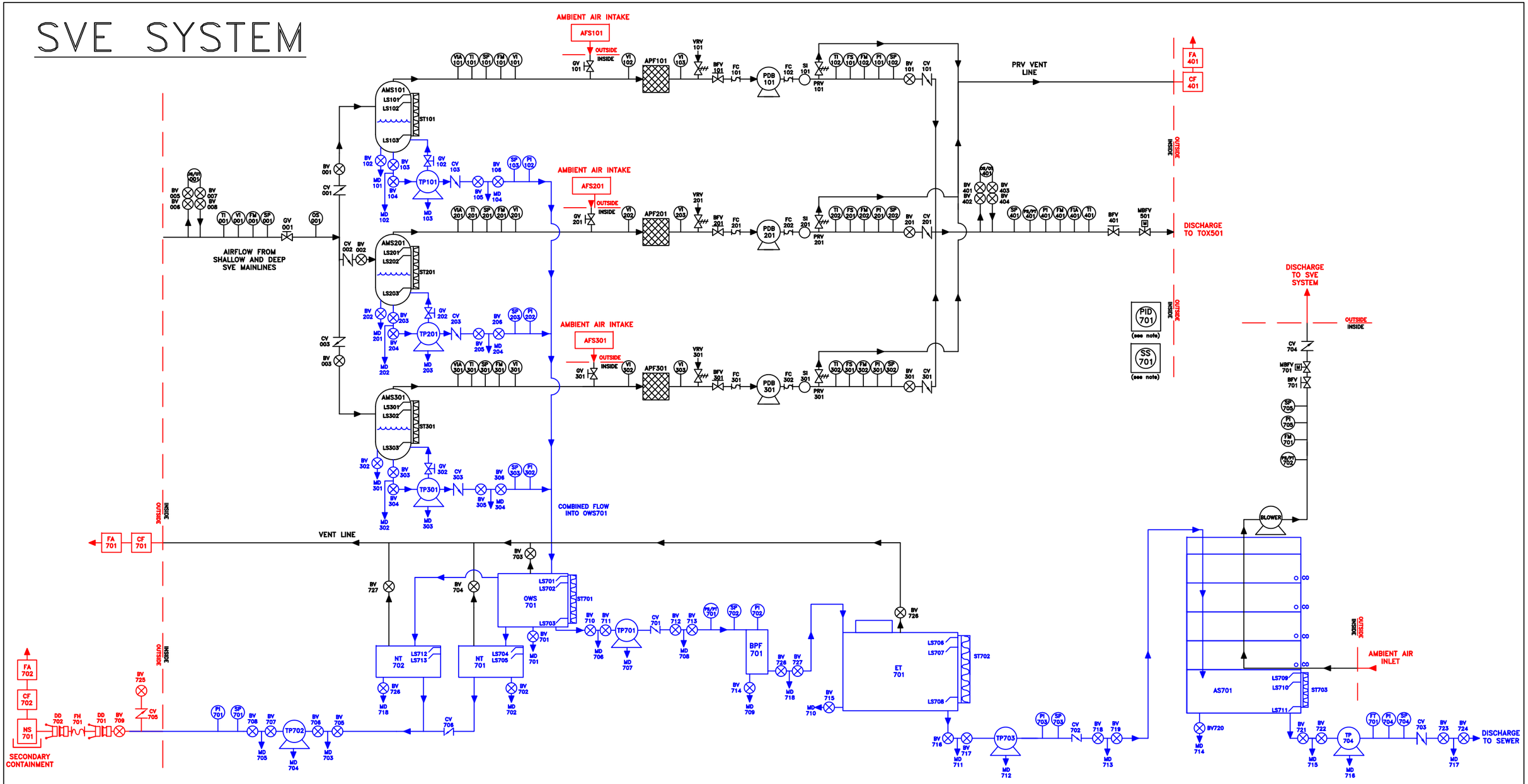
- SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
- AI: AIR INJECTION
- NO HEAT TRACE ON LATERALS TO WELLHEAD OR WELL RISERS
- VALVE AND FITTING WRAPPING NOT REQUIRED
- SELF REGULATING (SR) 240V OR 277V COPPER BRAID THERMOPLASTIC HEAT TAPE WITH POWER/END SEAL/ THERMOSTATIC KIT CLASS 1/DIV II. INSTALL LED TROUBLE LIGHTS ON EACH END

30' 0' 30' 60'

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: PIPING HEAT TRACE W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: JTH	DRAWING NO.: FIGURE 17
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	

SVE SYSTEM



LEGEND:

AFS	Air Filter/Silencer	FT	Flow Totalizer	PS	Pressure Switch
AMS	Air Moisture Separator	GV	Gate Valve	PT	Pressure Transducer
APF	Air Particulate Filter	HM	Hour Meter	QCV	Quick Connect Valve
AS	Air Stripper	LEL	Lower Explosive Limit	SI	Silencer
BFV	Butterfly Valve	LS	Level Switch	SP	Sample Port
BPF	Bag Particulate Filter	MBFV	Motorized Butterfly Valve	SS	Seismic Sensor
BV	Ball Valve	MD	Manual Drain	ST	Sight Tube
CF	Carbon Filter	NS	Non-Aqueous Phase Liquid (NAPL) Storage	SVE	Soil Vapor Extraction
CO	Clean Out	NT	NAPL Tank	TI	Temperature Indicator
CV	Check Valve	OS	Oxygen Sensor	TOX	Thermal Oxidizer Unit
DD	Dry Disconnect	OT	Oxygen Transducer	TP	Transfer Pump
ET	Equalization Tank	OWS	Oil/Water Separator	VI	Vacuum Indicator
FA	Flame Arrester	PDB	Positive Displacement Blower	VIA	Vacuum Indicator Analog
FH	Flexible Hose	PI	Pressure Indicator	VRV	Vacuum Relief Valve
FIA	Flow Indicator Analog	PID	Photolonization Detector Meter		
FM	Differential Flow Meter	PRV	Pressure Relief Valve		
FS	Flow Switch				

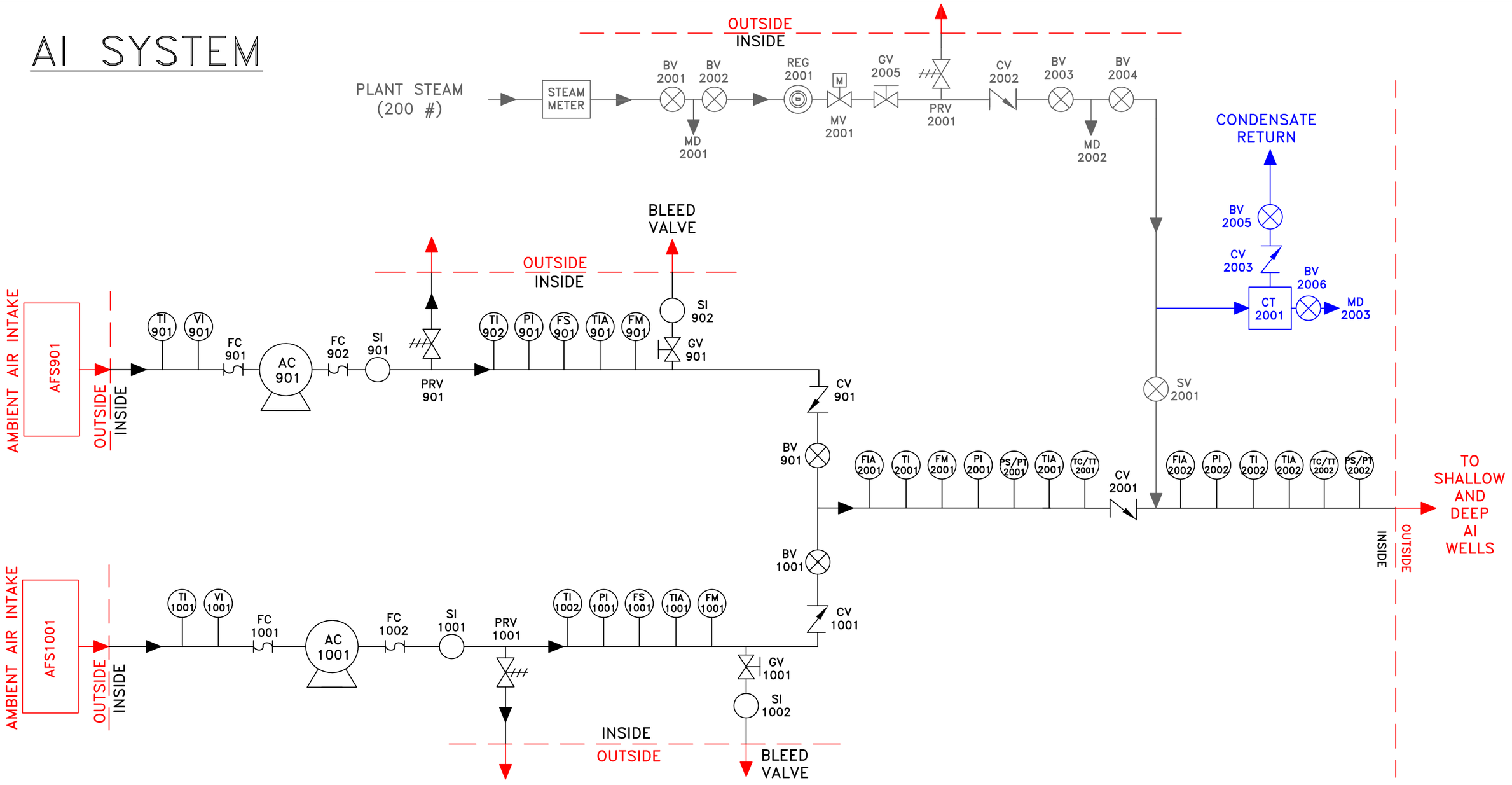
NOTES:

- Equipment to be placed/installed outside the equipment container/building shown in red.
- Water stream line shown in blue.
- Air stream line shown in black.
- All manual drain ball valves will be plugged.
- Pressure relief valves (PRVs) may be added to vents to prevent pressure buildup if ball valves BV703 and/or BV704 are accidentally closed.
- FT701 will be used to measure discharge totals and will be monitored via programmable logic controller (PLC) telemetry.
- All process piping will be carbon or stainless steel.
- PID 701 – A VOC meter will be mounted on the inside of the equipment container/building to monitor conditions inside.
- SS 701 – A seismic sensor will be mounted on the inside of the building to provide alarm notification of any seismic incident of magnitude 5.0 or greater within a 50 mile radius.
- HM 101, HM 102, HM 201, HM 202, HM 301, HM 302, HM 701, HM 702, HM 703, HM 704, and HM 705 Runtime Meters are for PDB 101, TP 101, PDB 201, TP 201, PDB 301, TP 301, TP 701, TP 702, TP 703, TP 704, and AS 701 respectively.

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: SVE PIPING AND INSTRUMENTATION DIAGRAM W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: MAW	DRAWING NO.: FIGURE 18
CHECKED BY: DK	REV: 2
PROJ. MGMT. APPROVAL: SCC	

AI SYSTEM



LEGEND:

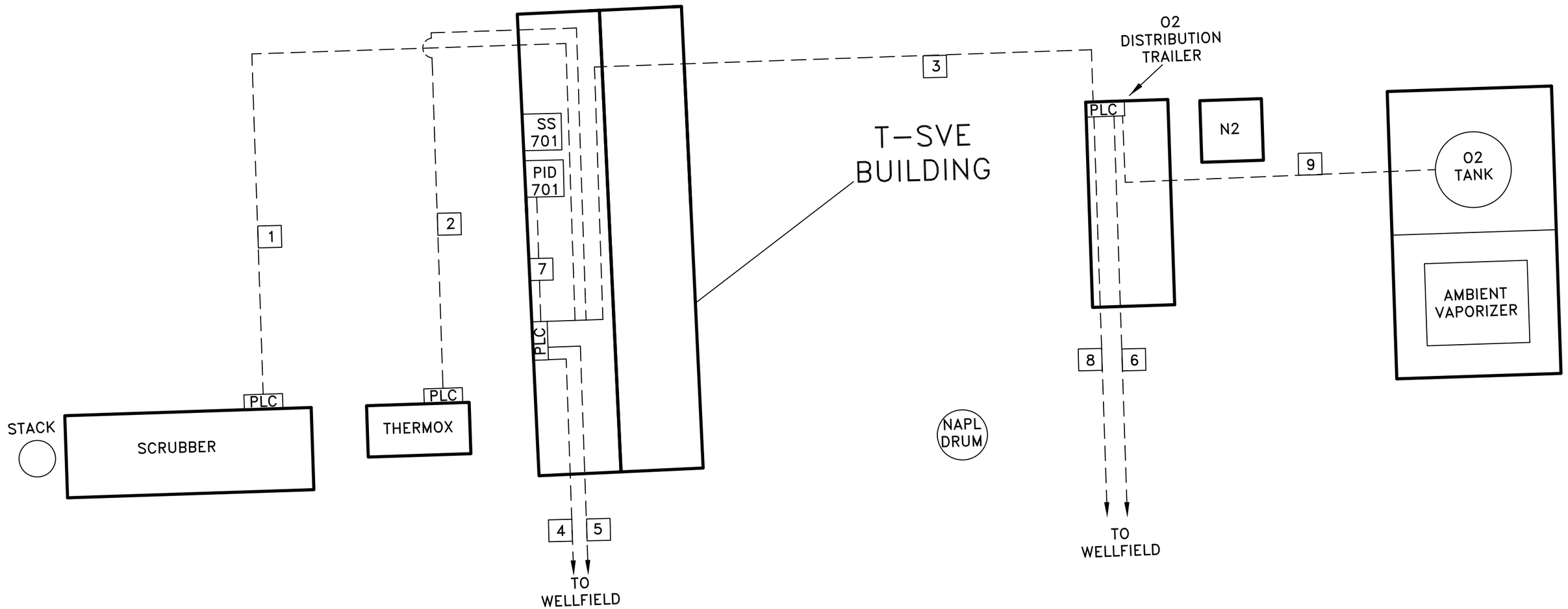
AC	Air Compressor	MV	Motorized Valve
AI	Air Injection	PI	Pressure Indicator
AFS	Air Filter/Silencer	PRV	Pressure Relief Valve
BV	Ball Valve	PS	Pressure Switch
CT	Condensation Trap	PT	Pressure Transducer
CV	Check Valve	REG	Flow Regulator
FC	Flex/Flange Coupling	SI	Silencer
FIA	Flow Indicator Analog	SV	Solenoid Valve
FM	Differential Flow Meter	TC	Temperature Controller
FS	Flow Switch	TI	Temperature Indicator
GV	Gate Valve	TIA	Temperature Indicator Analog
HE	Heat Exchanger	TT	Temperature Transducer
HM	Hour Meter	VI	Vacuum Indicator
MD	Manual Drain		

NOTES:

- Equipment to be placed/installed outside the equipment container/building shown in red.
- Air stream line shown in black.
- Steam line shown in gray.
- Water line shown in blue.
- All manual drain ball valves will be plugged.
- All process piping will be carbon steel.
- HM 901 and HM 1001 Total Runtime Meters are for AC 901 and AC 1001, respectively.

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: AI PIPING AND INSTRUMENTATION DIAGRAM W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: MAW	DRAWING NO.: FIGURE 19
CHECKED BY: DK	REV: 2
PROJ. MGMT. APPROVAL: SCC	

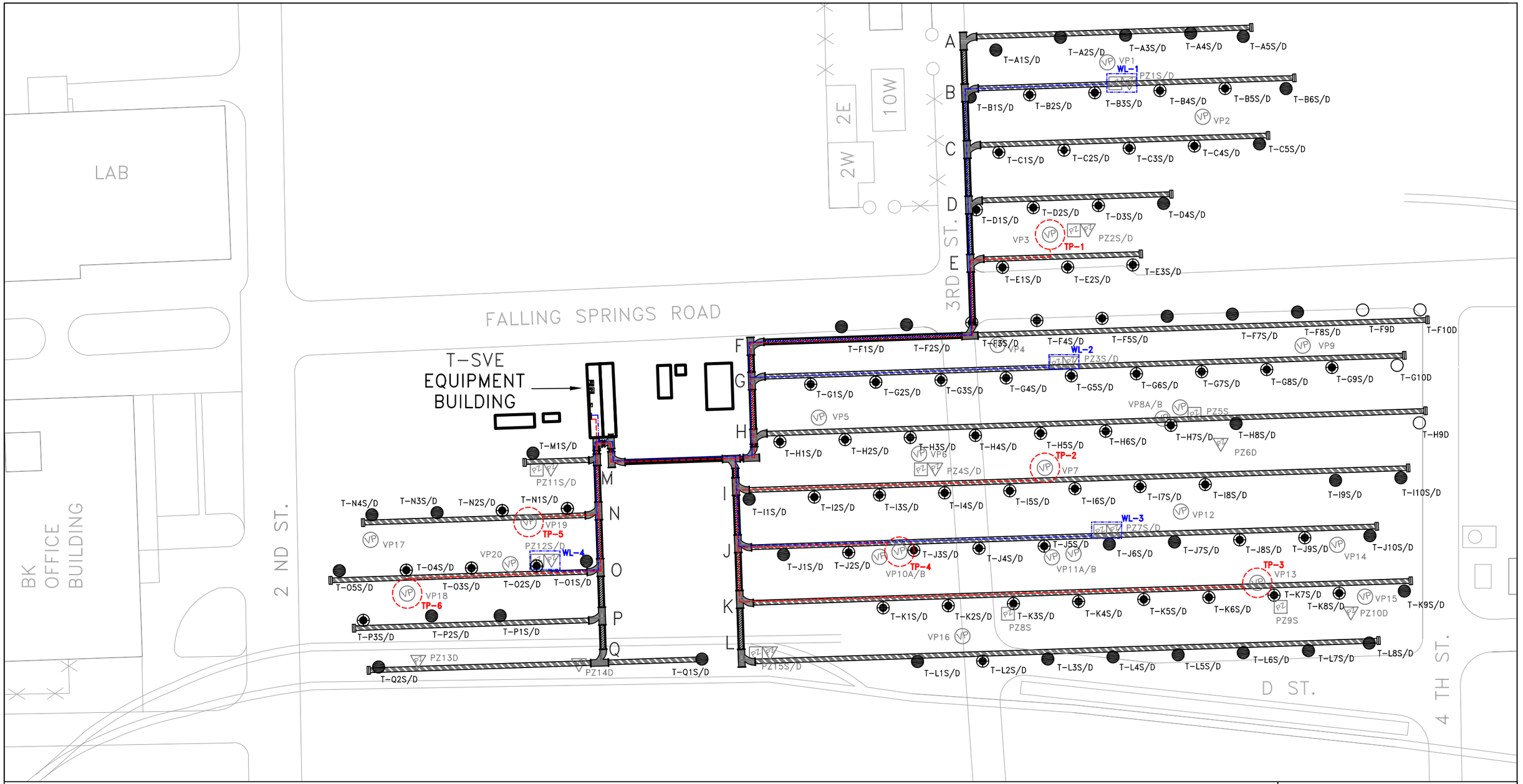


CONDUIT INTERLOCK	# OF INTERLOCKS	CONTROL/INTERLOCK CONNECTIONS	WIRE TYPE/GAUGE	APPROXIMATE CONDUIT LENGTH (FT)	SETS OF WIRES
1	2	PAH403/PAL403 – HIGH/LOW PRESSURE SPRAY	18 AWG / 2 WIRE W/ GROUND	60	6 + 1 SPARE
	1	TAH403 – QUENCH TEMPERATURE			
	2	LAH402/LALL402 – SUMP HIGH/LOW			
	1	AAL401/AAH401 – pH HIGH/LOW AND READOUT			
2	1	THERMOX READY (SVE START) AND ALLOW OPENING OF INLET VALVE	18 AWG / 2 WIRE W/ GROUND	50	2 + 1 SPARE
	1	THERMOX ALARM (SHUT DOWN SVE AND SCRUBBER) – CLOSE INLET VALVE			
3	1	O2 TRAILER – O2 SENSORS TRIGGER FULL SHUTDOWN (REFER TO 100% EABR DESIGN)	18 AWG / 2 WIRE W/ GROUND	50	2 + 1 SPARE
	1	SVE/THERMOX PROCESS INLET – O2 SENSORS TRIGGER FULL SHUTDOWN			
4	11	TEMPERATURE PROBES/DATA LOGGER	18 AWG / 2 WIRE W/ GROUND	SEE FIGURE 21	SEE FIGURE 21
5	4	WATER LEVEL TRANSDUCERS/DATA LOGGER	SUPPLIED BY OTHERS		
6	10	DO PROBES/DATA LOGGER (4 WIRE, 24V DC, 4–20 MA – REFER TO 100% EABR DESIGN			
7	2	PID701 (SVE BUILDING VOCs)/SS701 SEISMIC SWITCH– TRIGGER FULL SHUTDOWN	18 AWG / 2 WIRE W/ GROUND	10	2
8	221	SOLENOID VALVES SV401–SV591 and SV601–630 (REFER TO 100% EABR DESIGN)	18 AWG / 2 WIRE W/ GROUND	REFER TO 100% EABR DESIGN	221 + 30 SPARES (1 PER SOLENOID VALVE BANK)
9	1	OXYGEN SUPPLY SOLENOID VALVE SV001 (REFER TO 100% EABR DESIGN)	18 AWG / 2 WIRE W/ GROUND	REFER TO 100% EABR DESIGN	1

5' 0' 5' 10'

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: ELECTRICAL DETAILS – SENSORS AND INTERLOCKS WIRING W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 20
CHECKED BY: LBC	REV: 1
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- COMBINATION SHALLOW AND DEEP SVE WELL LOCATION
- DEEP SVE WELL LOCATION
- SVE/AI WELL LOCATION
- SWEEP TEE
- BLIND FLANGE
- 4-INCH CARBON STEEL PIPING
- 8-INCH CARBON STEEL PIPING
- 12-INCH CARBON STEEL PIPING
- A — LEG IDENTIFICATION LETTER
- (VP) — PROPOSED SHALLOW AND DEEP NESTED VAPOR PROBE LOCATION
- PZ — PROPOSED SHALLOW PIEZOMETER LOCATION
- PZ — PROPOSED DEEP PIEZOMETER LOCATION
- TP-1 — PROPOSED TEMPERATURE PROBE VAPOR PROBE LOCATION AND CONNECTIVE WIRING (REFER TO FIGURE 20 FOR SENSOR AND INTERLOCK WIRING DETAILS)
- WL-1 — PROPOSED WATER LEVEL TRANSDUCER PIEZOMETER LOCATION AND CONNECTIVE WIRING (REFER TO FIGURE 20 FOR SENSOR AND INTERLOCK WIRING DETAILS)

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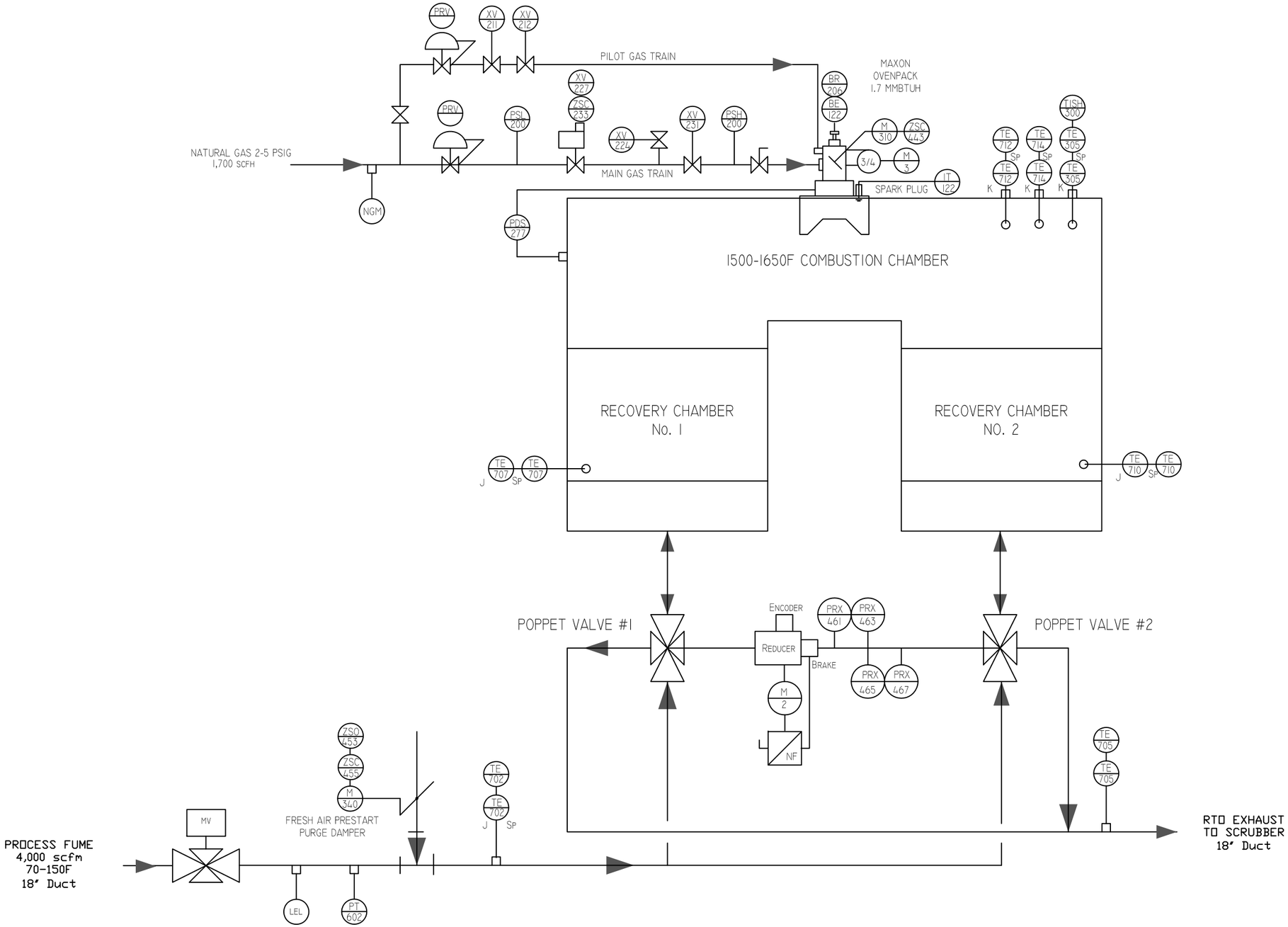
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: TEMPERATURE PROBE AND WATER LEVEL TRANSDUCER LOCATIONS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 21
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	



NOTES:

- Burner Management System (BMS) and overall Thermox unit must be designed in accordance with NFPA 86.
- Unit will be designed to 85 dBA at 10 feet.
- LEL meter will trigger system shutdown if unit fails electronically.
- BMS will have a self checking scanner that will shut down in the event of any flame abnormalities.
- MV = Motorized Shutoff Valve
- NGM = Natural Gas Meter
- LEL = Lower Explosive Limit Meter

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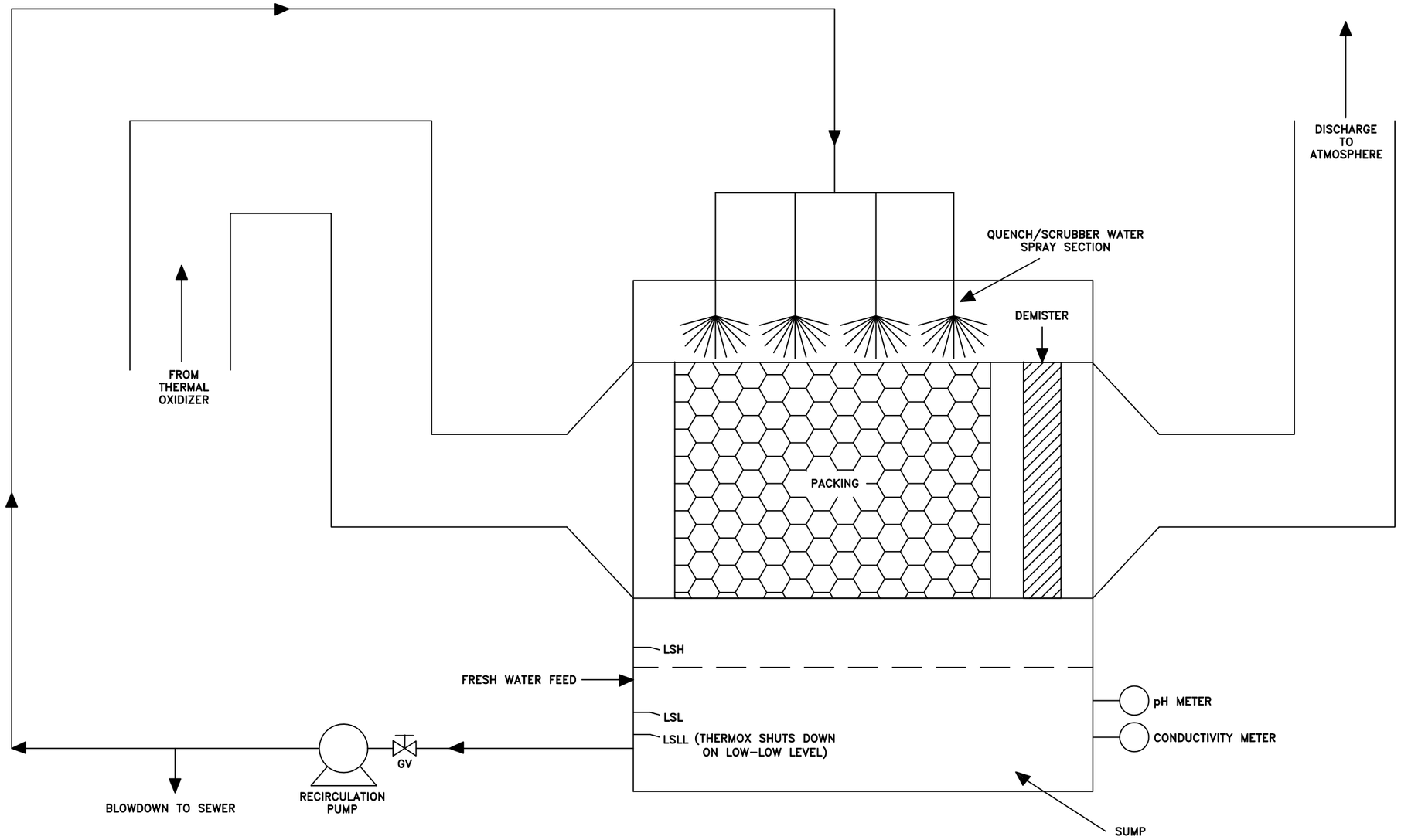
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: THERMOX PIPING AND INSTRUMENTATION DIAGRAM W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: MAW	DRAWING NO.: FIGURE 22
CHECKED BY: DK	REV: 1
PROJ. MGMT. APPROVAL: SCC	

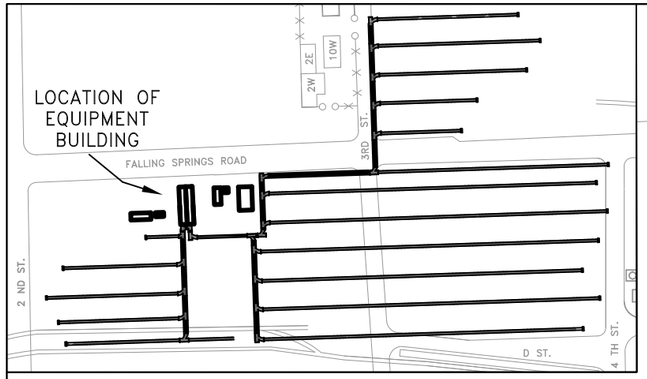


LEGEND:

GV	Gate Valve
LSH	Level Switch High
LSL	Level Switch Low
LSLL	Level Switch Low-Low

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: ACID-GAS SCRUBBER PIPING AND INSTRUMENTATION DIAGRAM W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 23
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	



FALLING SPRINGS ROAD

T–SVE EQUIPMENT CONTAINERS

SEWER

NAPL DRUM

MUST HAVE 50' MINIMUM SEPARATION BETWEEN NAPL STORAGE AND O2 TANK

O2 DISTRIBUTION TRAILER

6' X 6' N2 CONCRETE PAD

N2 CYLINDER 12–PACK (43.5" X 35")

FILL CONNECTION

10'

2'

28'

2'

VALVE SKID

O2 TANK

14' x 16' CONCRETE PAD

AMBIENT VAPORIZER

14' x 16' CONCRETE PAD

2'

16'

2'

BOLLARDS

SCRUBBER

THERMOX

STACK

SEWER

WATER

WATER (ALONG T–SVE/EABR PIPE RACKS)
TO SEWER 1–FF (ALONG T–SVE/EABR PIPE RACKS)

LEGEND:

- 4–INCH CARBON STEEL PIPING
- 8–INCH CARBON STEEL PIPING
- 12–INCH CARBON STEEL PIPING
- SWEEP TEE
- BLIND FLANGE

NOTES:

- N2: NITROGEN
- NAPL: NON–AQUEOUS PHASE LIQUID
- O2: OXYGEN
- THERMOX: REGENERATIVE THERMAL OXIDIZER
- SVE: SOIL VAPOR EXTRACTION
- T–SVE: THERMALLY ENHANCED SVE
- THE THERMOX AND SCRUBBER CANNOT BE WITHIN 20' OF ANY PIPE RACKS

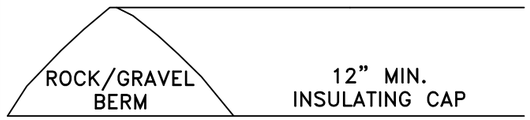
5' 0' 5' 10'

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: EQUIPMENT BUILDING LAYOUT W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: MAW	DRAWING NO.: FIGURE 24
CHECKED BY: LBC	REV: 1
PROJ. MGMT. APPROVAL: SCC	

CROSS-SECTION A-A': EDGE DETAIL

A A'



~12"

NARROW BERM ~ 12" HIGH CONSTRUCTED USING EXISTING SITE MATERIALS.

LEGEND:

- T-SVE COMBINATION SHALLOW AND DEEP WELL LOCATION
- T-SVE DEEP WELL LOCATION
- AIR INJECTION WELL LOCATION
- SHALLOW AND DEEP NESTED VAPOR PROBE LOCATION
- SHALLOW PIEZOMETER LOCATION
- DEEP PIEZOMETER LOCATION
- 0-15 FOOT INTERVAL COC EXCEEDANCE AREA
- INSULATING CAP

30' 0' 30' 60'

NOTES:

- COC: CONTAMINANT OF CONCERN

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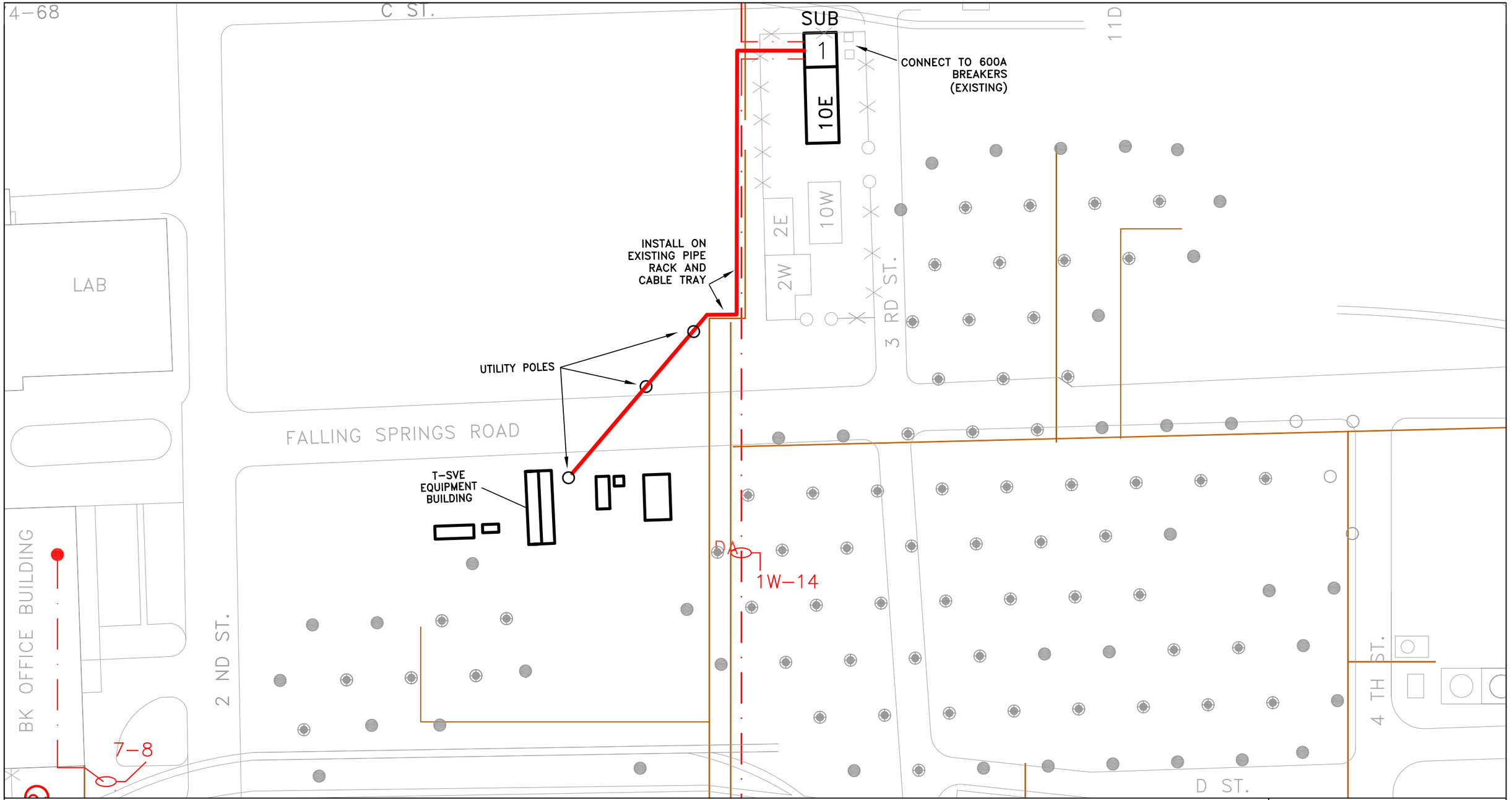
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: INSULATING CAP W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 25
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- EXISTING 480 VOLT OVERHEAD ELECTRICAL LINE
- PROPOSED 13.8 KILOVOLT OVERHEAD ELECTRICAL LINE
- PIPE BRIDGE
- T-SVE COMBINATION SHALLOW AND DEEP WELL LOCATION
- T-SVE DEEP WELL LOCATION
- AIR INJECTION WELL LOCATION

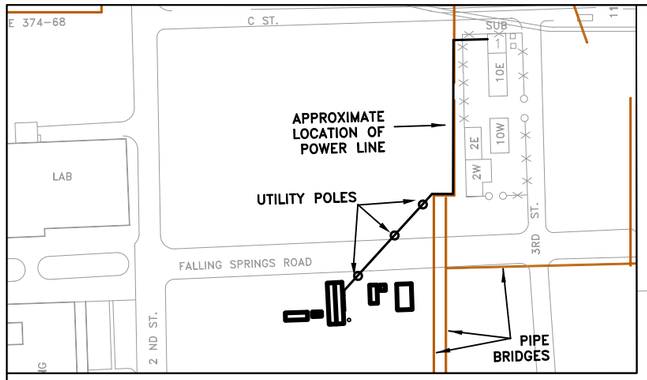
30' 0' 30' 60'

NOTES:

- BASE MAP PROVIDED BY W.G. KRUMMRICH FACILITY.
- ONLY 480 VOLT POWER FEEDERS ARE INDICATED, NOT ALL 480 VOLT CABLES.

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: ELECTRICAL UTILITIES LAYOUT W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 26
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	



T-SVE BUILDING

FALLING SPRINGS ROAD

INCOMING MAIN POWER

UTILITY POLE

O2 DISTRIBUTION TRAILER

PLC

N2

O2 TANK

AMBIENT VAPORIZER

GROUND ROD

PP-1

SP-3

SP-2

SP-1

PLC

SP-6

LIGHTNING ROD/GROUND

SP-5 PLC

SCRUBBER

STACK

SP-4 PLC

THERMOX

GROUND ROD

NAPL DRUM

PP-1	MAIN PANEL	NEMA 3R, 480V/277V, 3PH, 4 WIRE
SP-1	T-SVE PANEL	NEMA 3R, 480V, 3PH, 4 WIRE
SP-2	T-SVE HVAC PANEL	NEMA 3R, 277V, 3PH, 4 WIRE
SP-3	HEAT TRACE PANEL	NEMA 3R, 277V, 3PH, 4 WIRE
SP-4	THERMOX PANEL	NEMA 3R, 480V, 3PH, 4 WIRE
SP-5	SCRUBBER PANEL	NEMA 3R, 480V, 3PH, 4 WIRE
SP-6	O2 BUILDING PANEL	NEMA 3R, 480V, 3PH, 4 WIRE

NOTES:

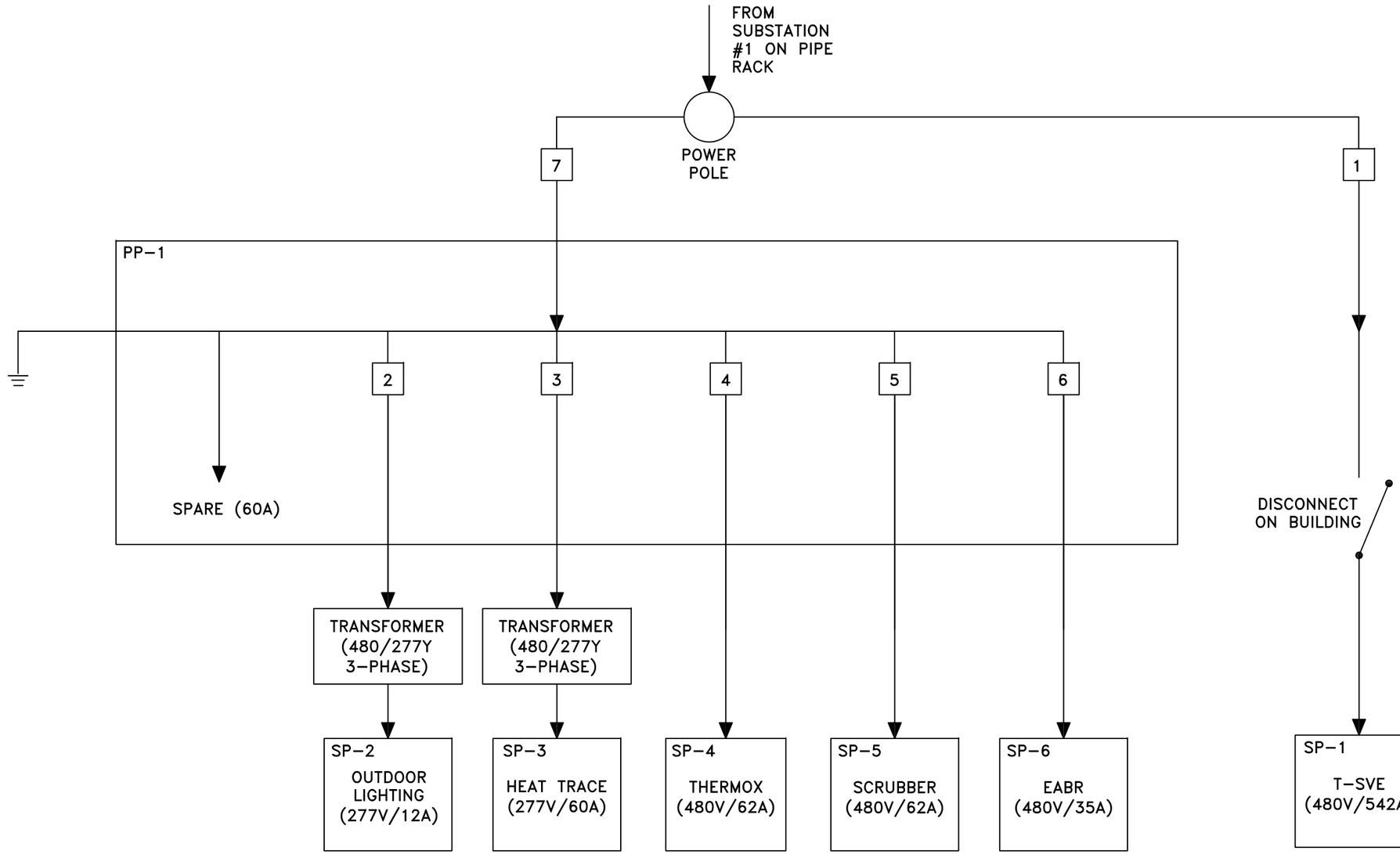
- HEAT TRACE - 10 W/FT SELF REGULATING (SR) 240 V COPPER BRAID THERMOPLASTIC HEAT TAPE, WITH POWER/END SEAL/THERMOSTAT KIT CLASS I/DIV II.
- UTILITY POLE - 40 FT CLASS II UTILITY POLE WITH CABLE TRAY OR ELECTRICAL NON-METALLIC TUBING (ENT) AND STRAIN RELIEF CORD GRIPS (CGB-TYPE).

- N2: NITROGEN
- NAPL: NON-AQUEOUS PHASE LIQUID
- O2: OXYGEN
- PLC: PROGRAMMABLE LOGIC CONTROLLER
- PP: POWER PANEL
- SP: SUB-PANEL
- SVE: SOIL VAPOR EXTRACTION
- V: VOLT

5' 0' 5' 10'

STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

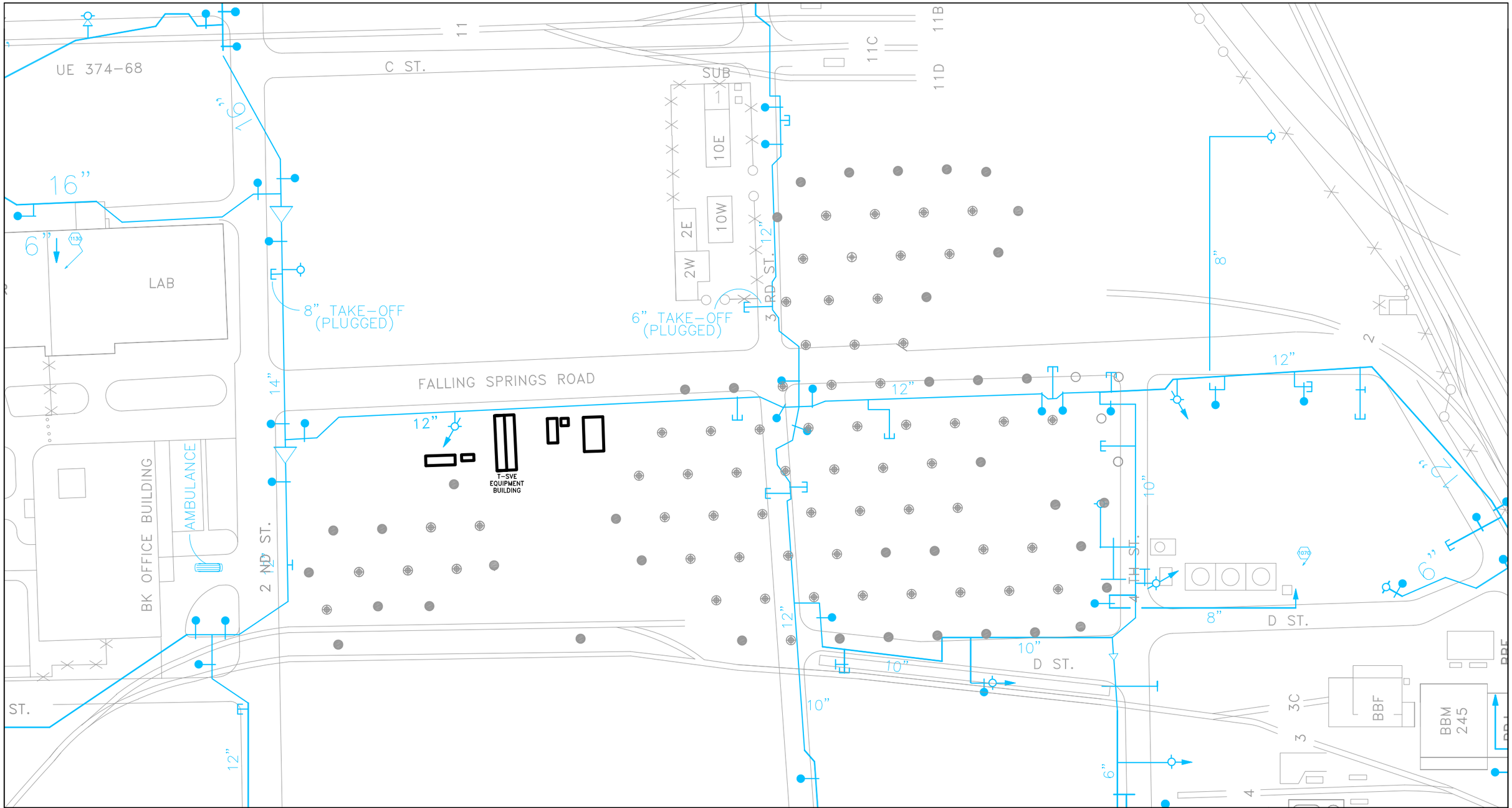
SCALE: AS SHOWN	TITLE: ELECTRICAL DETAILS - MAIN POWER AND SUB-PANEL LAYOUT W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: MAW	
CHECKED BY: LBC	DRAWING NO.: FIGURE 27
PROJ. MGMT. APPROVAL: SCC	REV: 2



ID	APPROXIMATE CABLE/CONDUIT DISTANCE (FT)	DESCRIPTION	WIRE TYPE/CAUGE
1	30	CABLE–3/CONDUCTOR COPPER WITH GROUND	SPECIFIED BY CONTRACTOR
2	20	CABLE–3/CONDUCTOR COPPER WITH GROUND	SPECIFIED BY CONTRACTOR
3	25	CABLE–3/CONDUCTOR COPPER WITH GROUND	SPECIFIED BY CONTRACTOR
4	70	CABLE–3/CONDUCTOR COPPER WITH GROUND	SPECIFIED BY CONTRACTOR
5	100	CABLE–3/CONDUCTOR COPPER WITH GROUND	SPECIFIED BY CONTRACTOR
6	60	CABLE–3/CONDUCTOR COPPER WITH GROUND	SPECIFIED BY CONTRACTOR
7	40	CABLE–3/CONDUCTOR COPPER WITH GROUND	SPECIFIED BY CONTRACTOR

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: ELECTRICAL DETAILS – ELECTRICAL LINE DIAGRAM W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA	
DRAWN BY: JWH	DRAWING NO.: FIGURE 28
CHECKED BY: SC	REV: 2
PROJ. MGMT. APPROVAL: SC	



LEGEND:

- MAIN SEWER LINE
- SECONDARY SEWER LINE
- 0-15 FOOT INTERVAL COC EXCEEDANCE AREA
- SOLID SEWER LID
- GRATED SEWER LID
- SEWER
- DRAIN
- PLUG OR CAP

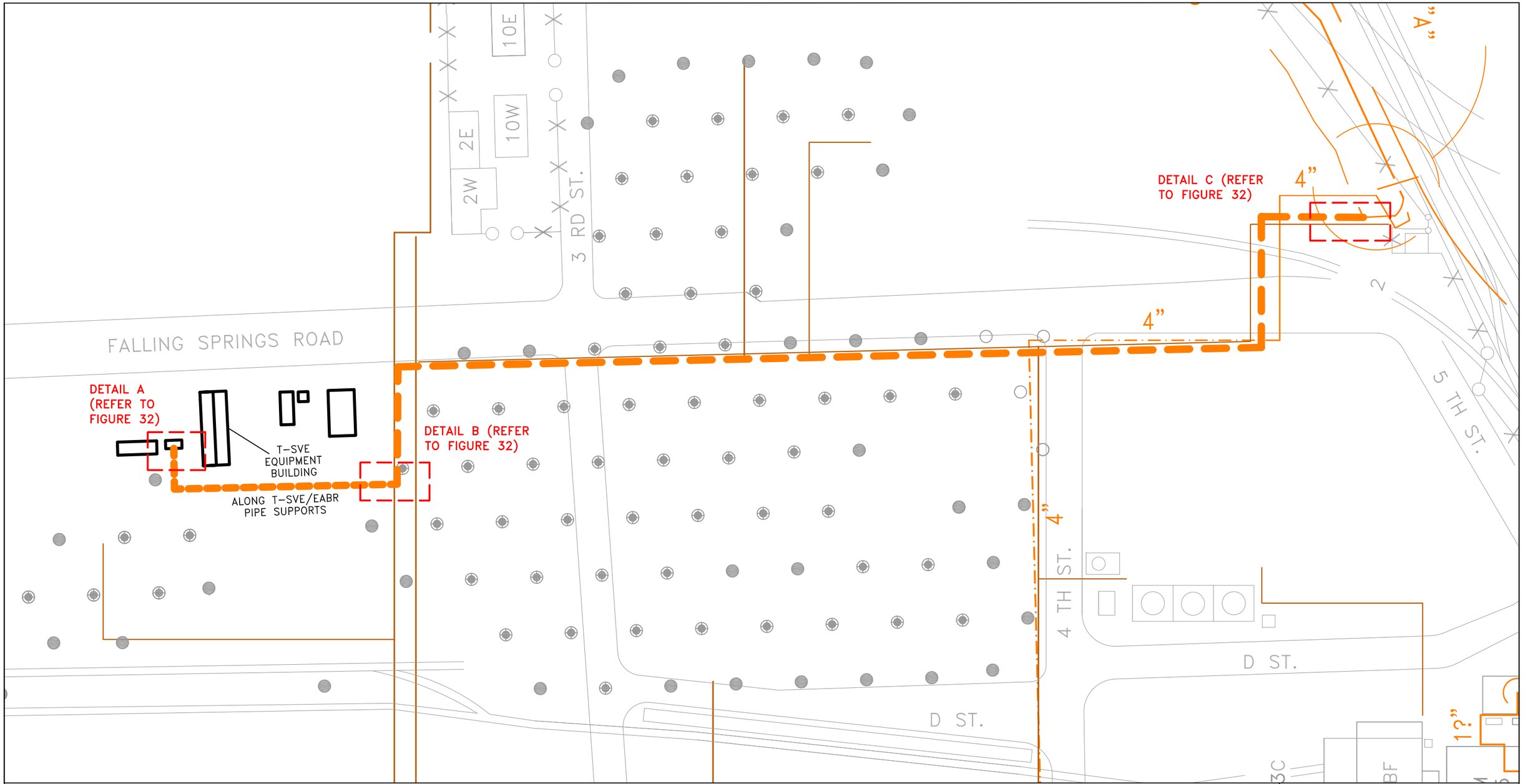
40' 0' 40' 80'

NOTES:

- BASE MAP PROVIDED BY W.G. KRUMMRICH FACILITY.
- ONLY 480 VOLT POWER FEEDERS ARE INDICATED, NOT ALL 480 VOLT CABLES.

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: FIRE PROTECTION UTILITIES W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 29
CHECKED BY: SCC	REV: 2
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- EXISTING OVERHEAD NATURAL GAS LINE
- PROPOSED OVERHEAD NATURAL GAS LINE (ALONG EXISTING PIPE BRIDGE)
- PROPOSED OVERHEAD NATURAL GAS LINE (ALONG T-SVE/EABR PIPE SUPPORTS)
- PIPE BRIDGE
- T-SVE COMBINATION SHALLOW AND DEEP WELL LOCATION
- T-SVE DEEP WELL LOCATION
- AIR INJECTION WELL LOCATION

NOTES:

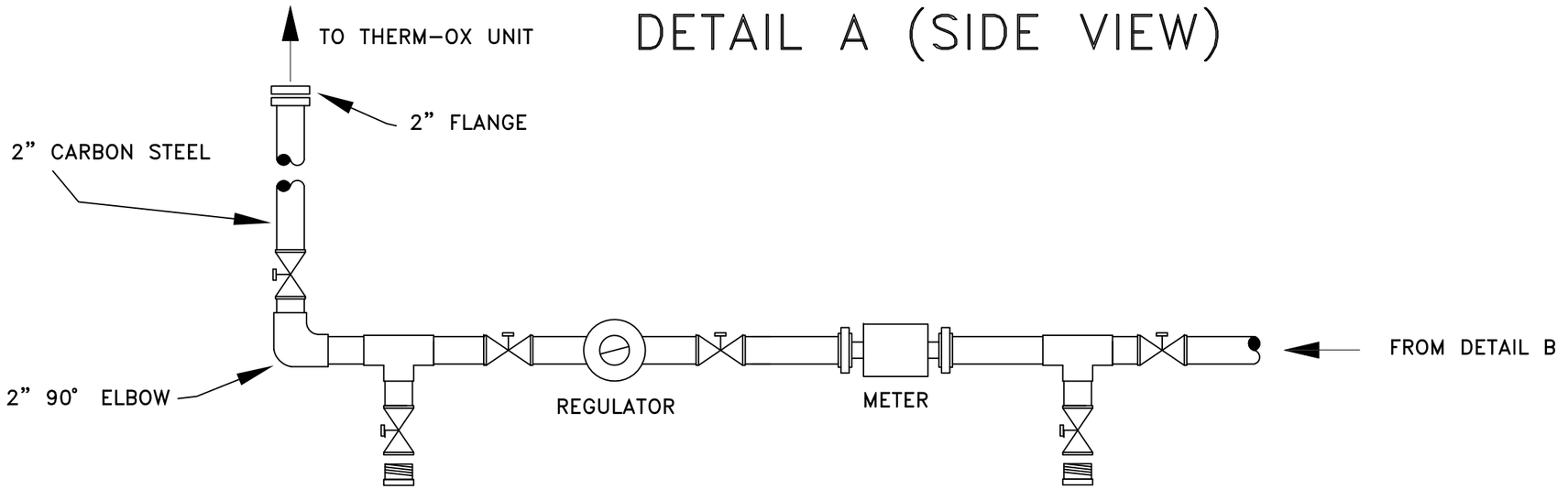
- BASE MAP PROVIDED BY W.G. KRUMMRICH FACILITY.
- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
- EABR: ENHANCED AEROBIC BIOREMEDIATION

30' 0' 30' 60'

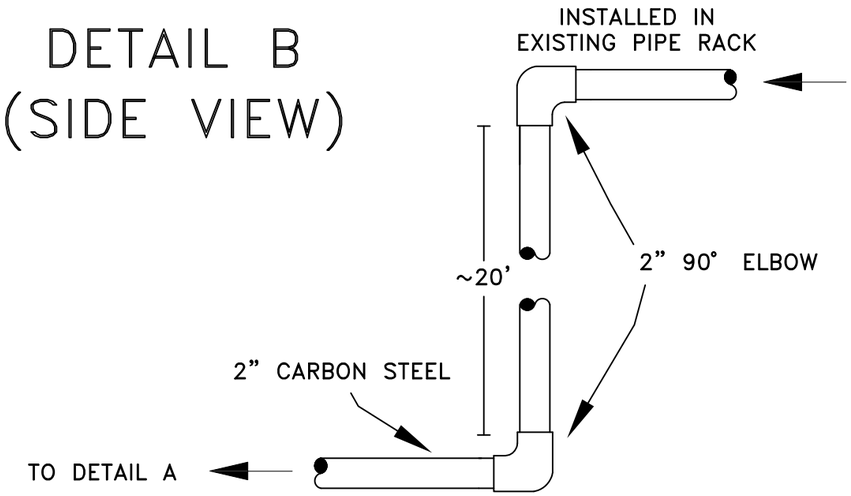
XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: NATURAL GAS SUPPLY LINE CONNECTION W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 30
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	

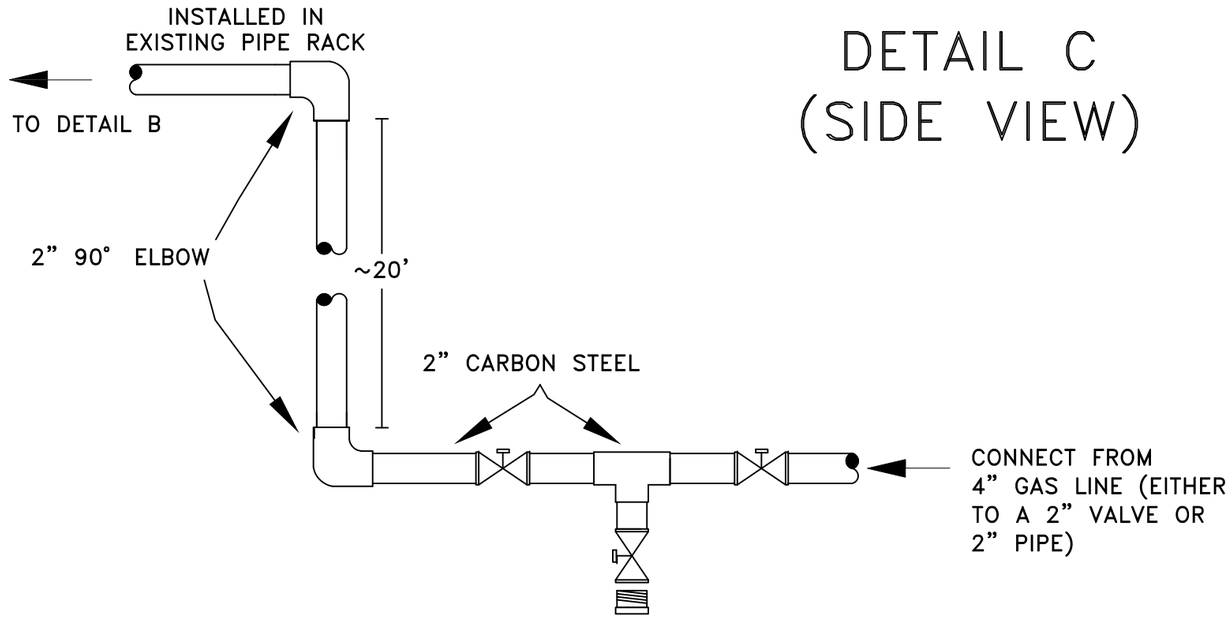
DETAIL A (SIDE VIEW)



DETAIL B (SIDE VIEW)



DETAIL C (SIDE VIEW)



LEGEND:

BALL VALVE

TEE CONNECTION

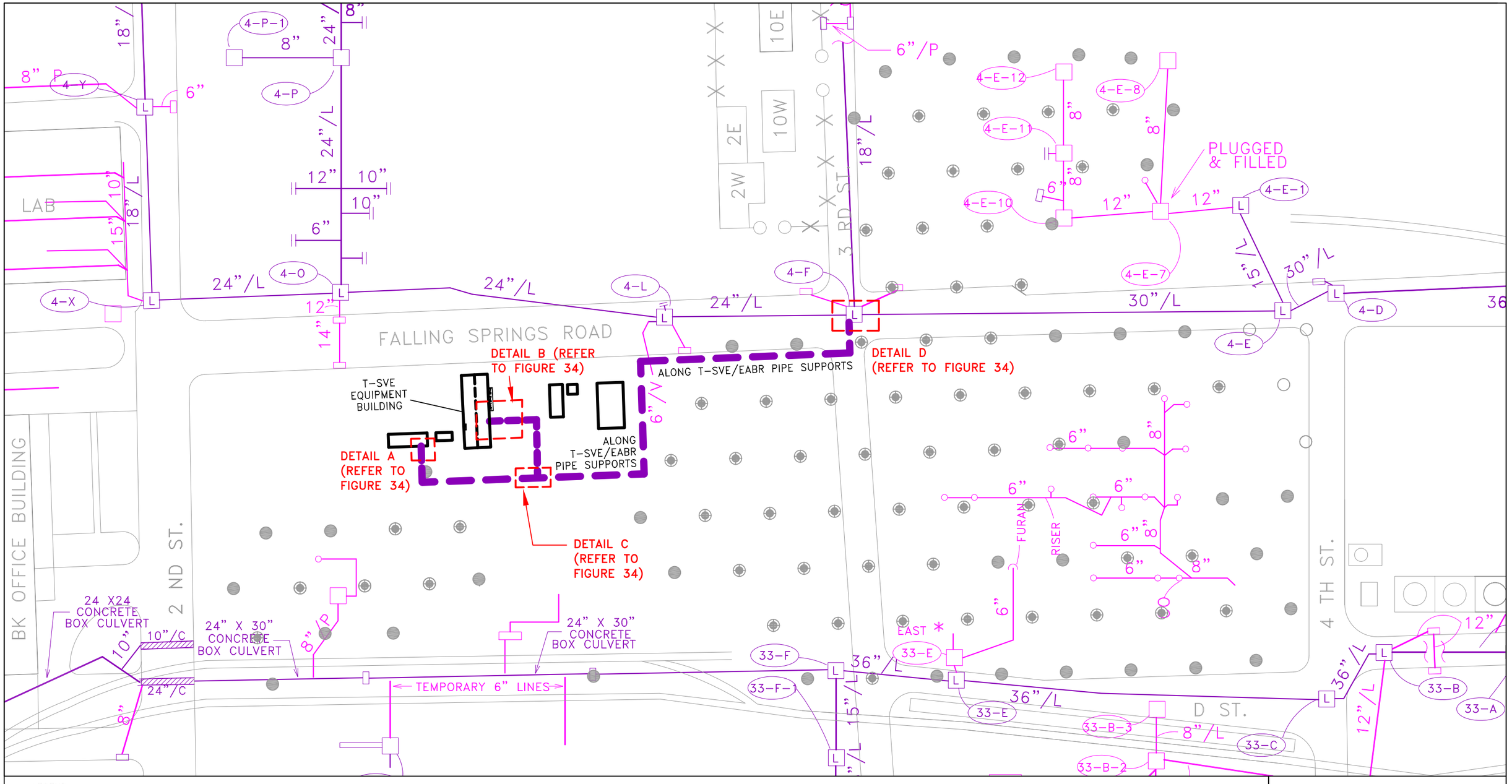
THREADED CAP

NOTES:

- INSTALLATION SHALL BE IN COMPLIANCE WITH SOLUTIA PMS BICS2 STANDARD PRACTICES
- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
- EABR: ENHANCED AEROBIC BIOREMEDIATION

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: NATURAL GAS SUPPLY LINE DETAILS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: JDA	DRAWING NO.: FIGURE 31
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- MAIN SEWER LINE
- SECONDARY SEWER LINE
- PROPOSED SEWER LINE
- TRENCH SEWER
- LINED SEWER SYSTEM
- 18"/V — 18" DIA. VITRIFIED CLAY PIPE SEWER LINE
- VINYL ESTER LINED MANHOLE
- STREET DRAIN
- GRATED SEWER LID
- SEWER
- DRAIN
- PLUG OR CAP
- T-SVE COMBINATION SHALLOW AND DEEP WELL LOCATION
- T-SVE DEEP WELL LOCATION
- AIR INJECTION WELL LOCATION

NOTES:

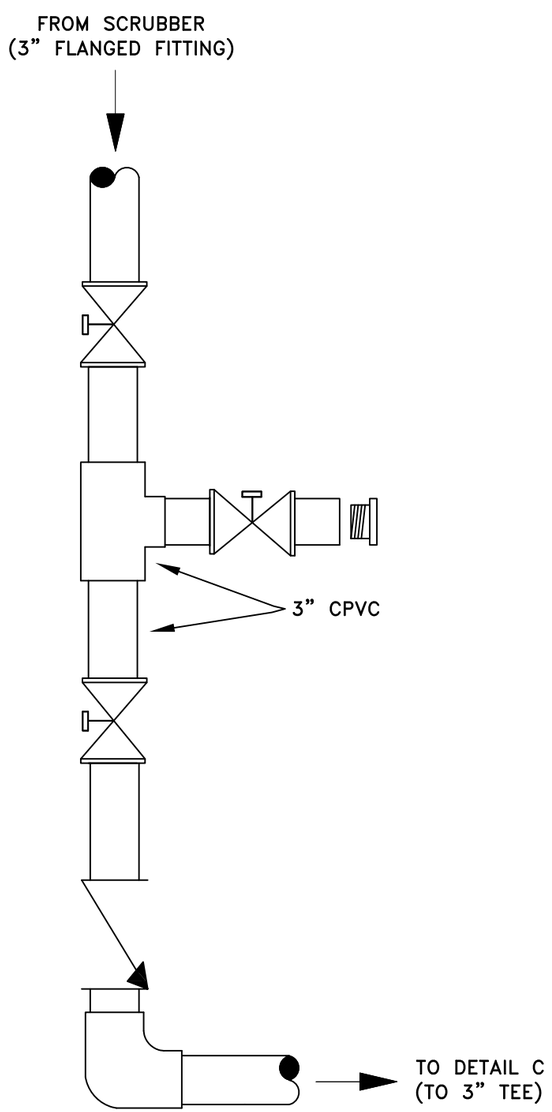
- BASE MAP PROVIDED BY W.G. KRUMMRICH FACILITY.
- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
- EABR: ENHANCED AEROBIC BIOREMEDIATION

30' 0' 30' 60'

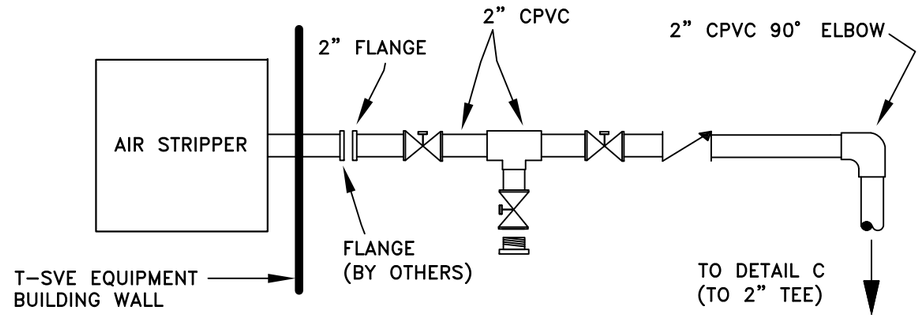
XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: SEWER DISCHARGE LINE CONNECTION W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 32 — REV: 2
CHECKED BY: SCC	
PROJ. MGMT. APPROVAL: SCC	

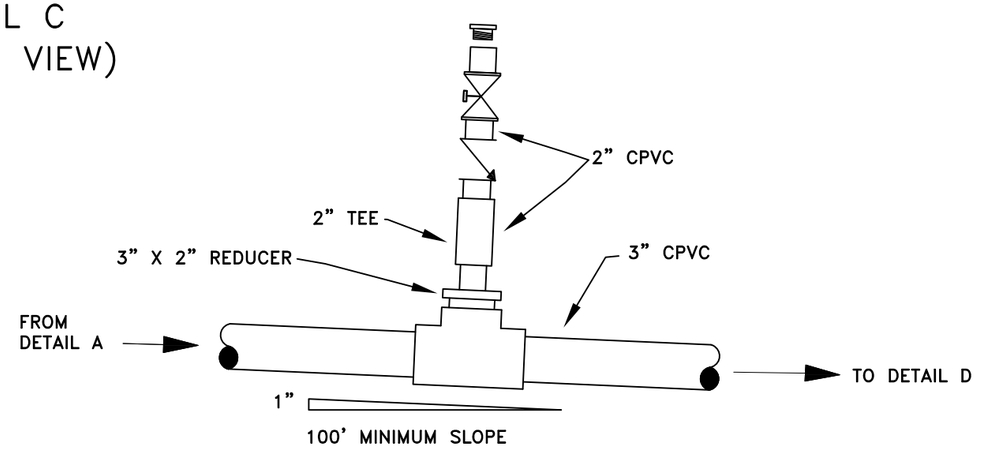
DETAIL A



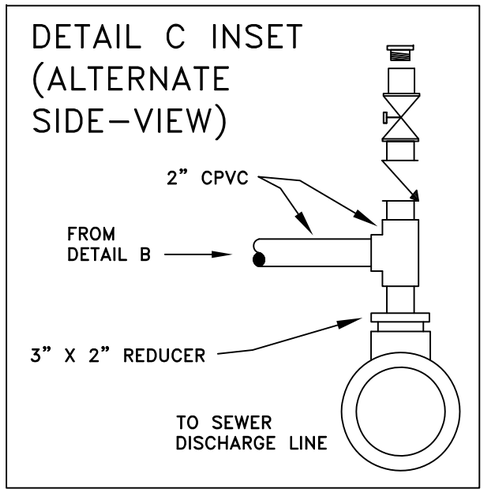
DETAIL B
(TOP VIEW)



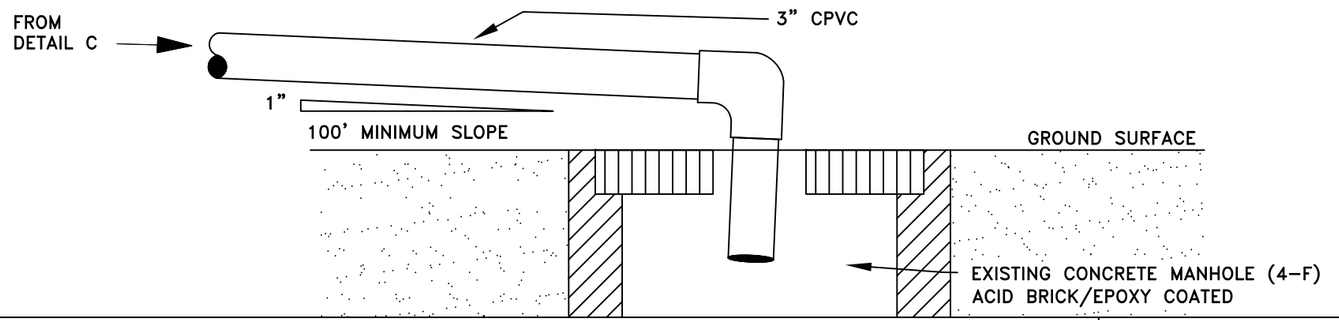
DETAIL C
(SIDE VIEW)



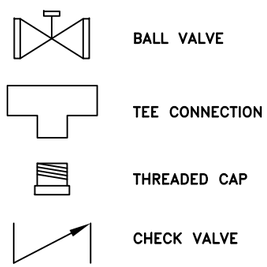
DETAIL C INSET
(ALTERNATE
SIDE-VIEW)



DETAIL D
(SIDE VIEW)



LEGEND:

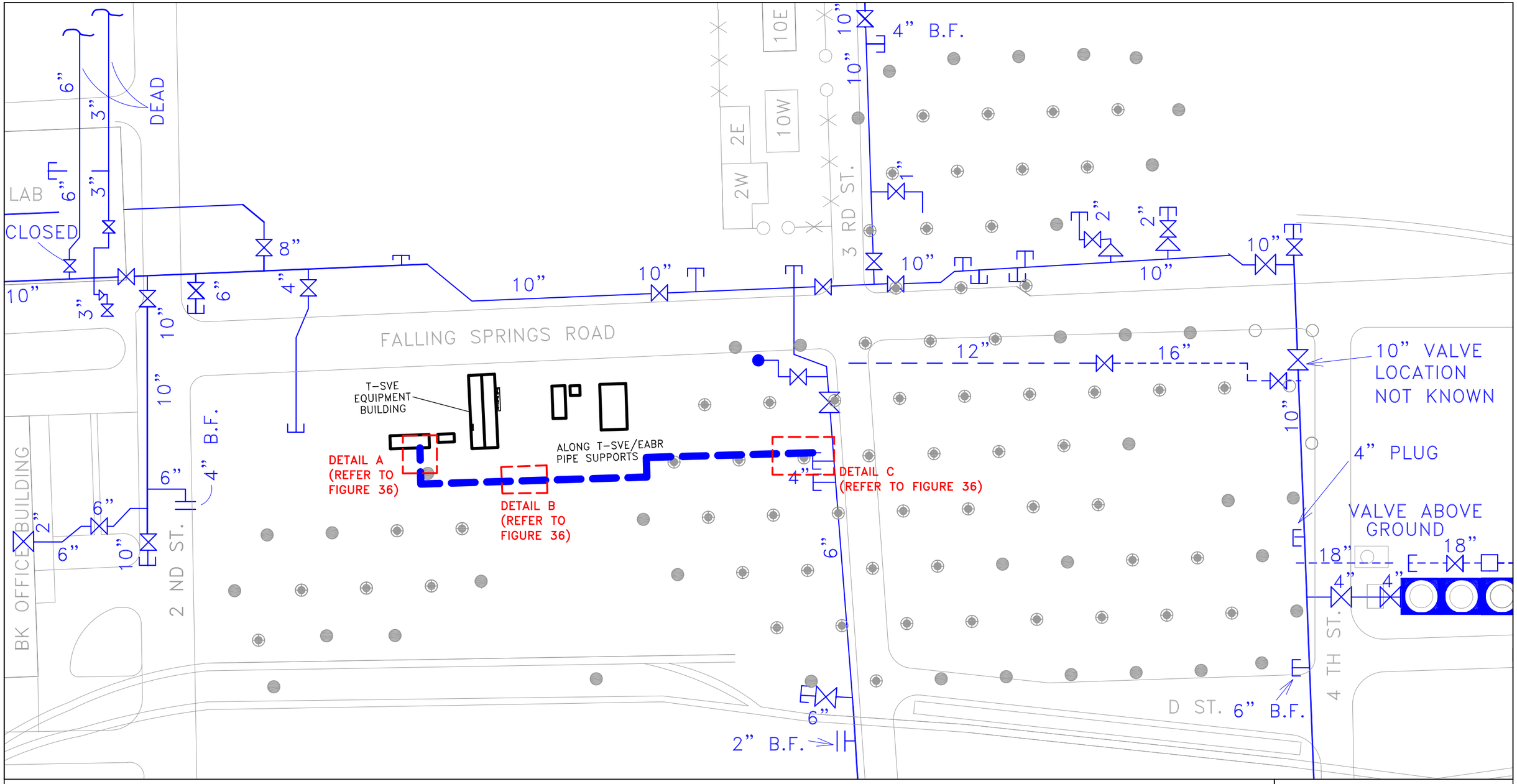


NOTES:

- CPVC: CHLORINATED POLYVINYL CHLORIDE

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: SEWER DISCHARGE LINE DETAILS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: JDA	DRAWING NO.: FIGURE 33
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

- EXISTING CITY WATER LINE (~3 FOOT BELOW GRADE)
- TOWER WATER LINE
- PROPOSED WATER LINE
- VALVE
- REDUCER
- METER INSTALLED
- CAP OR PLUG
- B.F. BLIND FLANGE
- SAFETY SHOWER
- T-SVE COMBINATION SHALLOW AND DEEP WELL LOCATION
- T-SVE DEEP WELL LOCATION
- AIR INJECTION WELL LOCATION

30' 0' 30' 60'

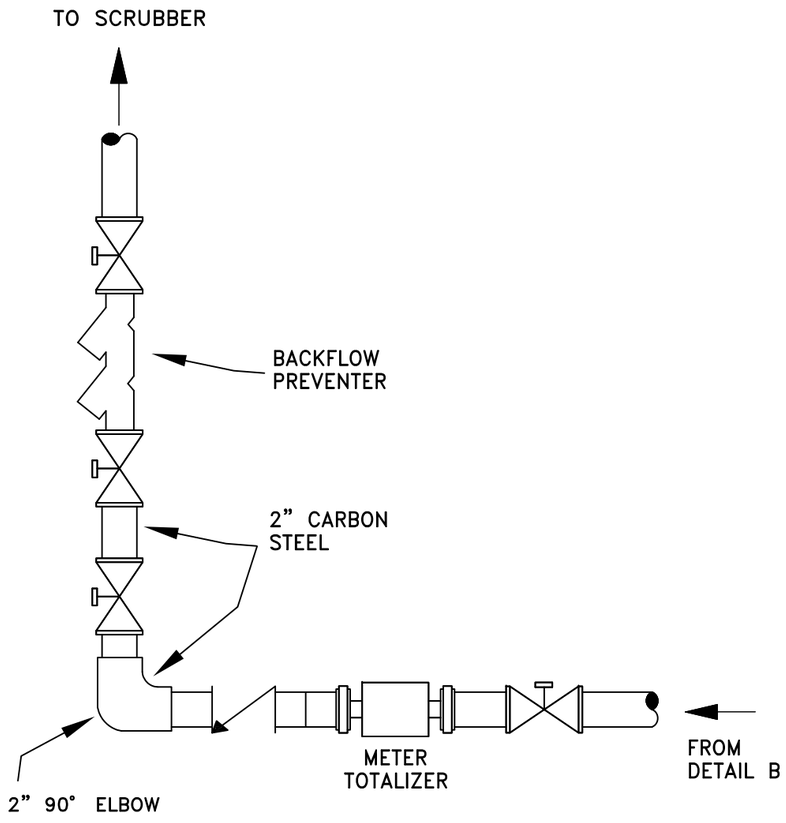
NOTES:

- BASE MAP PROVIDED BY W.G. KRUMMRICH FACILITY.
- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
- EABR: ENHANCED AEROBIC BIOREMDIATION

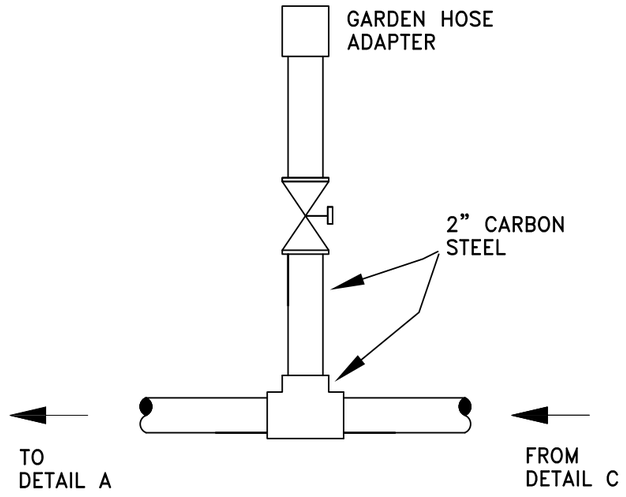
XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: WATER SUPPLY LINE CONNECTION W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 34
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	

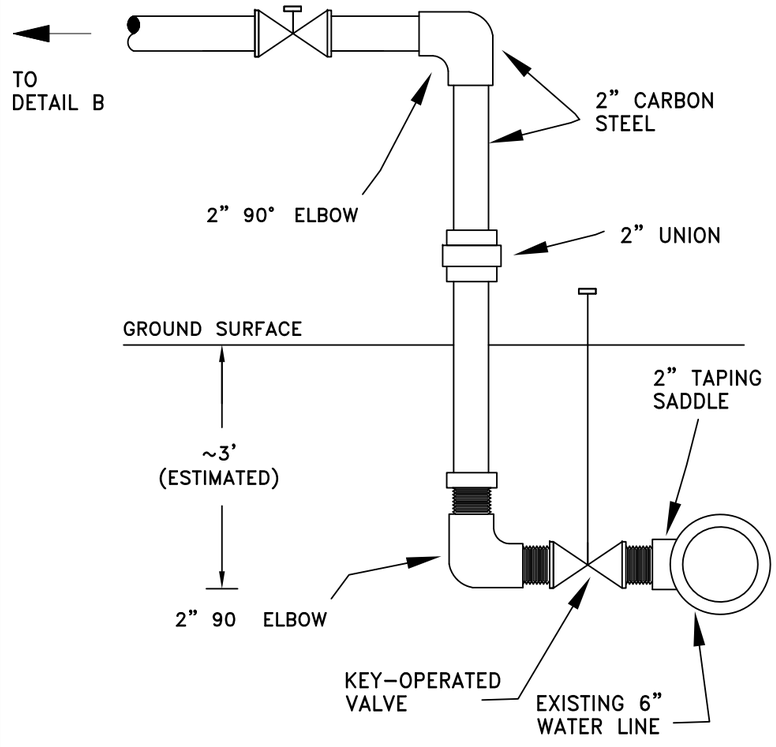
DETAIL A



DETAIL B



DETAIL C

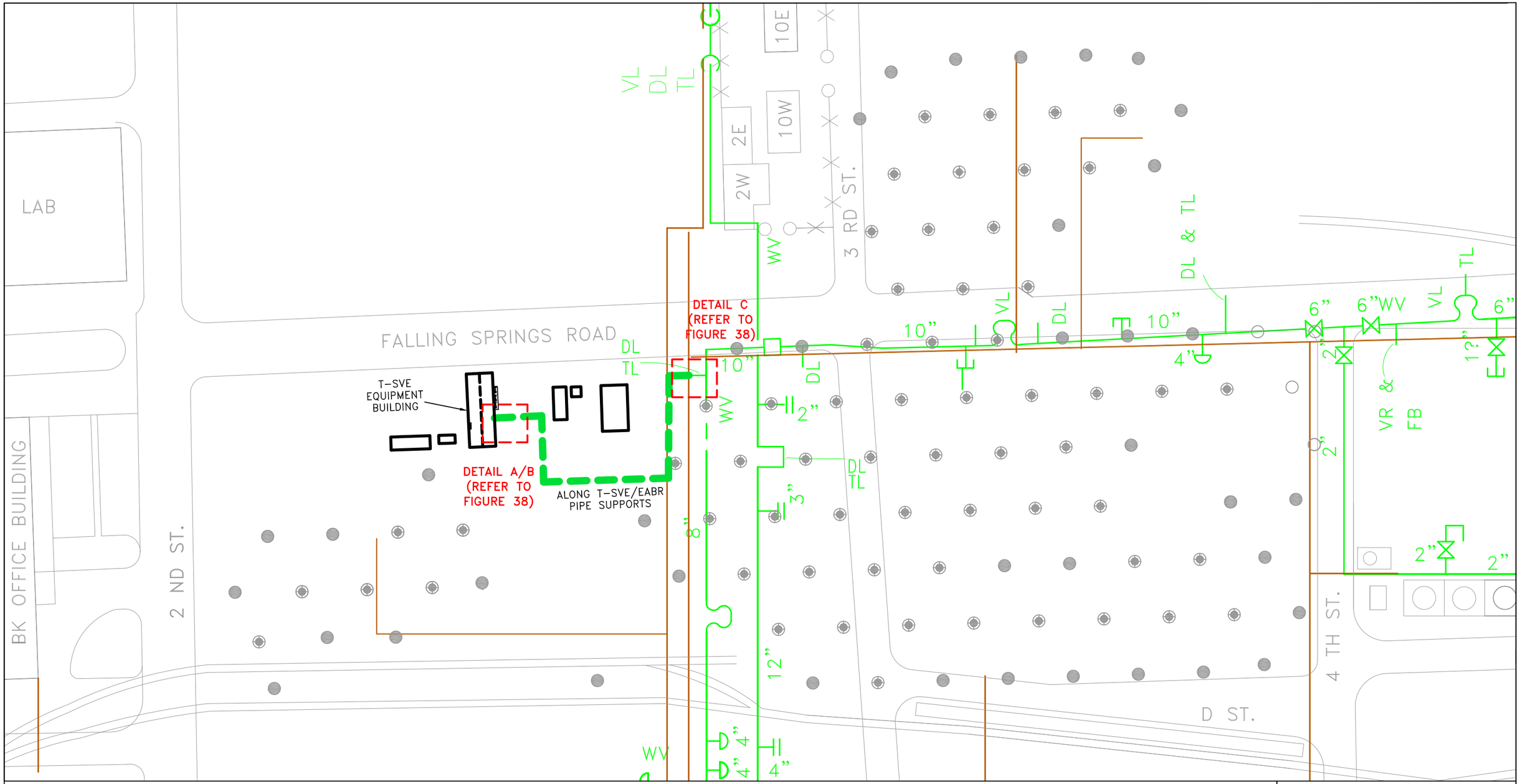


LEGEND:

- BALL VALVE
- TEE CONNECTION
- THREADED CAP
- CHECK VALVE

STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: WATER SUPPLY LINE DETAILS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: JDA	DRAWING NO.: FIGURE 35
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	



LEGEND:

PIPE BRIDGE	DL DRIP LEG
EXISTING 200 # STEAM LINE	FB FREE-BLOW CONNECTION
PROPOSED 200 # STEAM LINE	TL TRAP LINE
VALVE	WV WARM UP VALVE
REDUCER	VR VERTICAL RISER
METER INSTALLED	VL VERTICAL LOOP
BLANKED W/ CAP	T-SVE COMBINATION SHALLOW AND DEEP WELL LOCATION
BLANKED W/ BLIND FLANGE	T-SVE DEEP WELL LOCATION
	AIR INJECTION WELL LOCATION

NOTES:

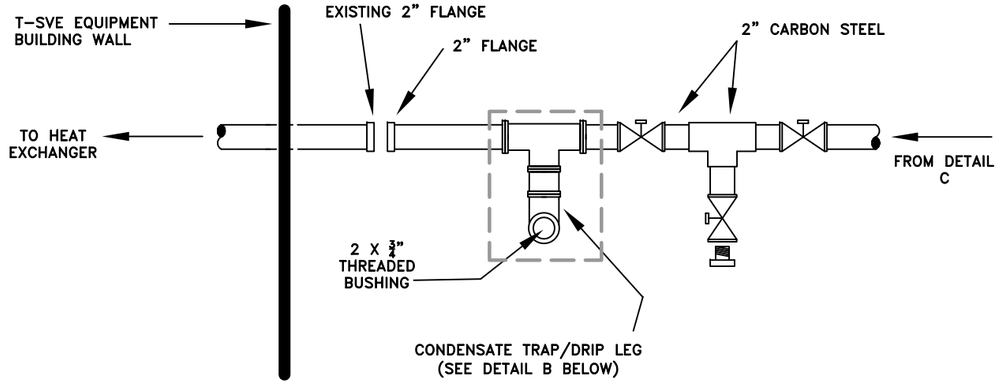
- BASE MAP PROVIDED BY W.G. KRUMMRICH FACILITY.
- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
- EABR: ENHANCED AEROBIC BIOREMEDIATION
- #: POUND

30' 0' 30' 60'

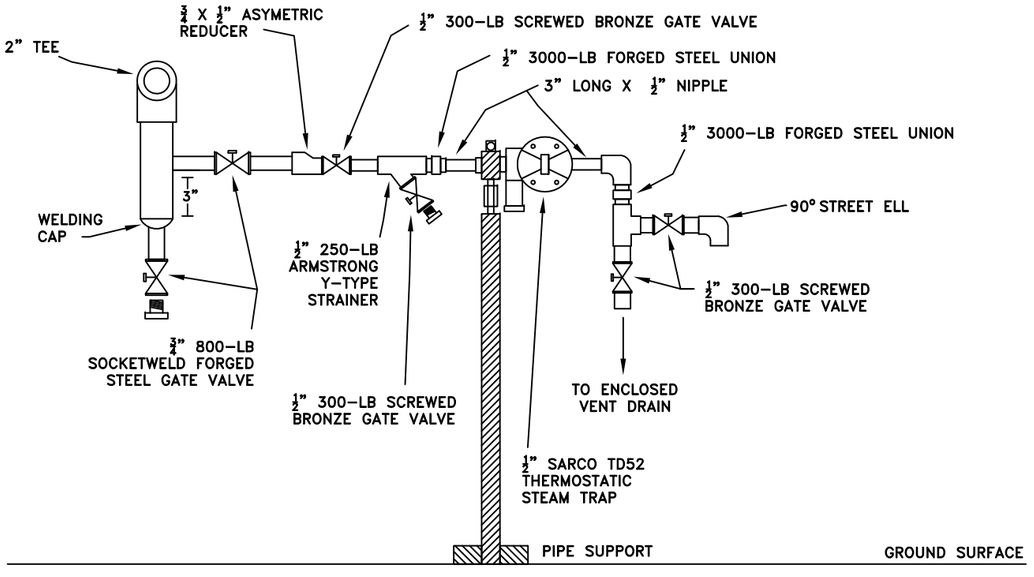
XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: AS SHOWN	TITLE: STEAM SUPPLY LINE CONNECTION W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: LBC	DRAWING NO.: FIGURE 36
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	

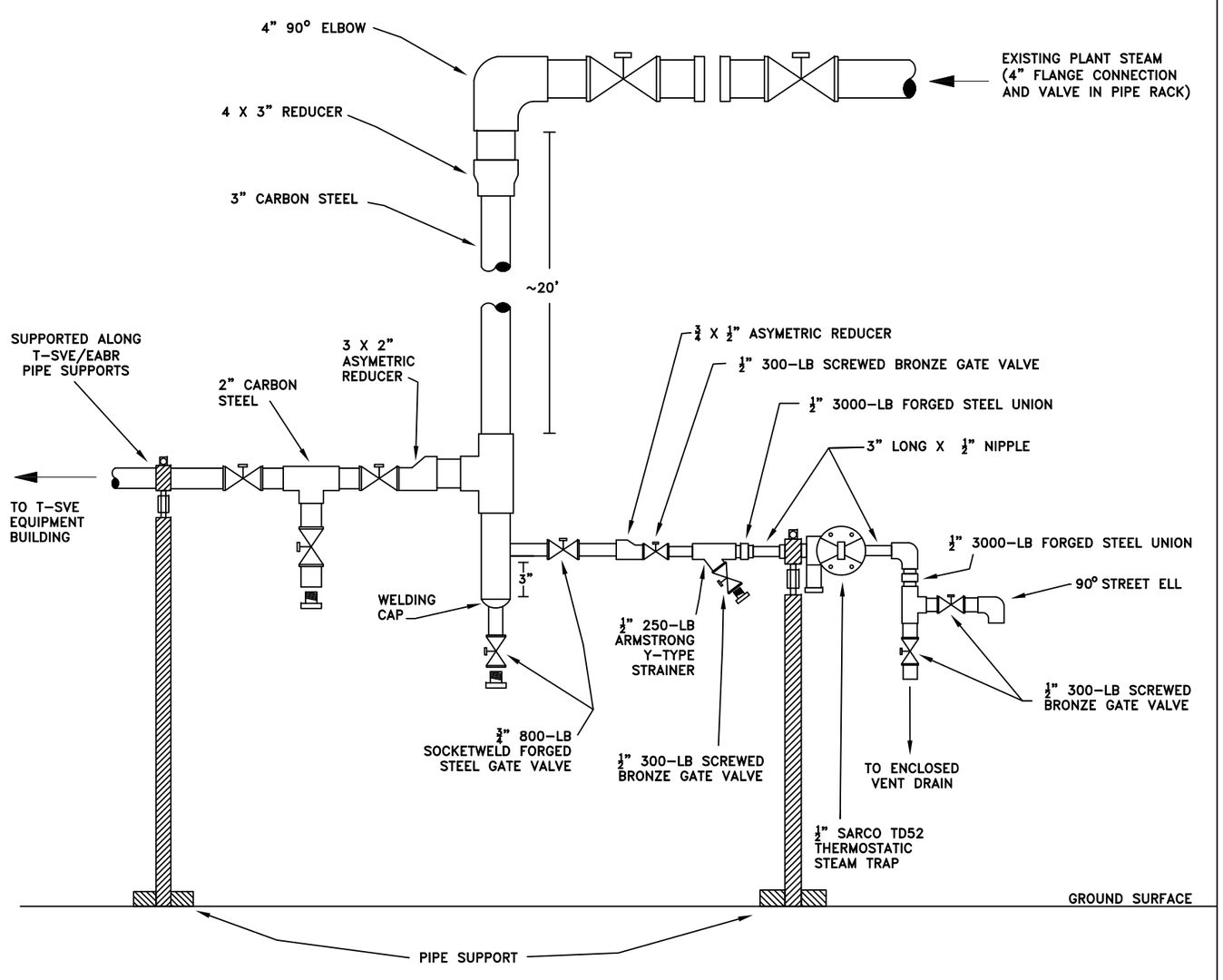
DETAIL A (SIDE VIEW)



DETAIL B INSET (SIDE VIEW)



DETAIL C (SIDE VIEW)



LEGEND:

- BALL VALVE
- TEE CONNECTION
- THREADED CAP
- CHECK VALVE

NOTES:

- INSTALLATION SHALL BE IN COMPLIANCE WITH SOLUTIA PMS BICS2 STANDARD PRACTICES
- T-SVE: THERMALLY ENHANCED SOIL VAPOR EXTRACTION
- EABR: ENHANCED AEROBIC BIOREMEDIATION

XDD
STRATEGIC. ENVIRONMENTAL. SOLUTIONS.

SCALE: NOT TO SCALE	TITLE: STEAM SUPPLY LINE DETAILS W.G. KRUMMRICH FACILITY SAUGET, IL
DATE: NOVEMBER 2011	
PROJECT NO.: 11003	
CLIENT: SOLUTIA INC.	
DRAWN BY: JDA	DRAWING NO.: FIGURE 37
CHECKED BY: SCC	REV: 3
PROJ. MGMT. APPROVAL: SCC	

FIGURE 38A - PROJECT SCHEDULE

Design, Permitting, and Construction

Chlorobenzene Process Area (CPA) Thermally Enhanced Soil Vapor Extraction (T-SVE) and Enhanced Aerobic Bioremediation (EABR) Treatment

W.G. Krummrich Facility, Sauget, Illinois

ID	Task Name	Start	Finish
1	CPA Design and Permitting	Mon 10/3/11	Fri 12/30/11
2	Full-Scale Design	Fri 11/4/11	Fri 11/4/11
3	Full-Scale Design Submittal to EPA	Fri 11/4/11	Fri 11/4/11
4	Permitting	Mon 10/3/11	Fri 12/30/11
5	Illinois Environmental Protection Agency Air Permit (T-SVE)	Mon 10/3/11	Fri 12/30/11
6	American Bottoms Waste Water Permit (T-SVE)	Mon 10/3/11	Fri 11/4/11
7	Underground Injection Control Notification (T-SVE and EABR)	Fri 11/4/11	Fri 11/4/11
8	CPA Equipment Fabrication	Mon 10/24/11	Fri 2/17/12
9	T-SVE/EABR Equipment Fabrication	Mon 10/31/11	Fri 2/17/12
10	Fabricator Notice to Proceed	Mon 10/31/11	Mon 10/31/11
11	Fabricator Submittal of Drawings	Mon 10/31/11	Fri 11/18/11
12	Solutia Review/Approval of Drawings	Mon 11/21/11	Fri 12/2/11
13	Fabrication/Delivery	Mon 12/5/11	Fri 2/17/12
14	ThermOx/Scrubber Equipment Fabrication	Mon 10/24/11	Fri 2/17/12
15	Fabricator Notice to Proceed	Mon 10/24/11	Mon 10/24/11
16	Fabricator Submittal of Drawings	Mon 10/24/11	Fri 11/11/11
17	Solutia Review/Approval of Drawings	Mon 11/14/11	Fri 11/25/11
18	Fabrication/Delivery	Mon 11/28/11	Fri 2/17/12
19	CPA Construction	Mon 9/26/11	Fri 3/2/12
20	Drilling	Mon 9/26/11	Fri 11/4/11
21	Geotechnical Borings	Mon 9/26/11	Fri 9/30/11
22	T-SVE Well Installation	Mon 10/3/11	Fri 11/4/11
23	EABR Well Installation	Mon 10/3/11	Fri 11/4/11
24	Insulating Concrete Cap Install	Mon 10/17/11	Fri 11/11/11
25	Install Insulating Concrete Cap	Mon 10/17/11	Fri 11/11/11
26	Manifold Installation	Mon 10/24/11	Fri 2/24/12
27	T-SVE Manifold Installation	Mon 10/24/11	Fri 2/10/12
28	EABR Manifold Installation	Mon 10/24/11	Fri 2/10/12
29	Utilities Installation	Mon 10/24/11	Fri 2/24/12
30	Electrical Installation	Mon 10/17/11	Fri 3/2/12
31	Electrical Installation	Mon 10/17/11	Fri 3/2/12
32	Equipment Installation	Mon 2/20/12	Fri 3/2/12
33	T-SVE Equipment Installation	Mon 2/20/12	Fri 3/2/12
34	EABR Equipment Installation	Mon 2/20/12	Fri 3/2/12
35	ThermOx / Scrubber Installation	Mon 2/20/12	Fri 3/2/12

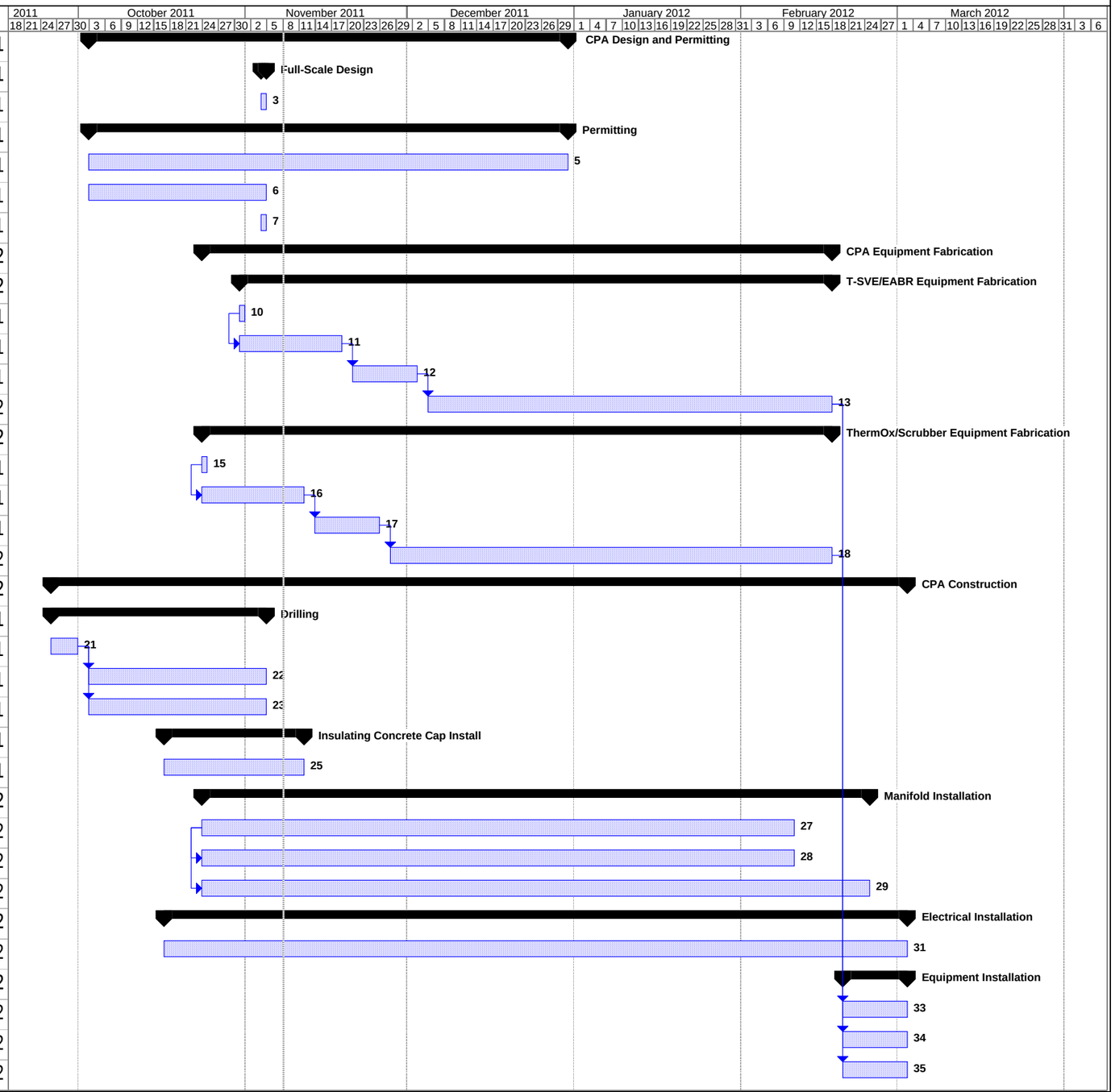
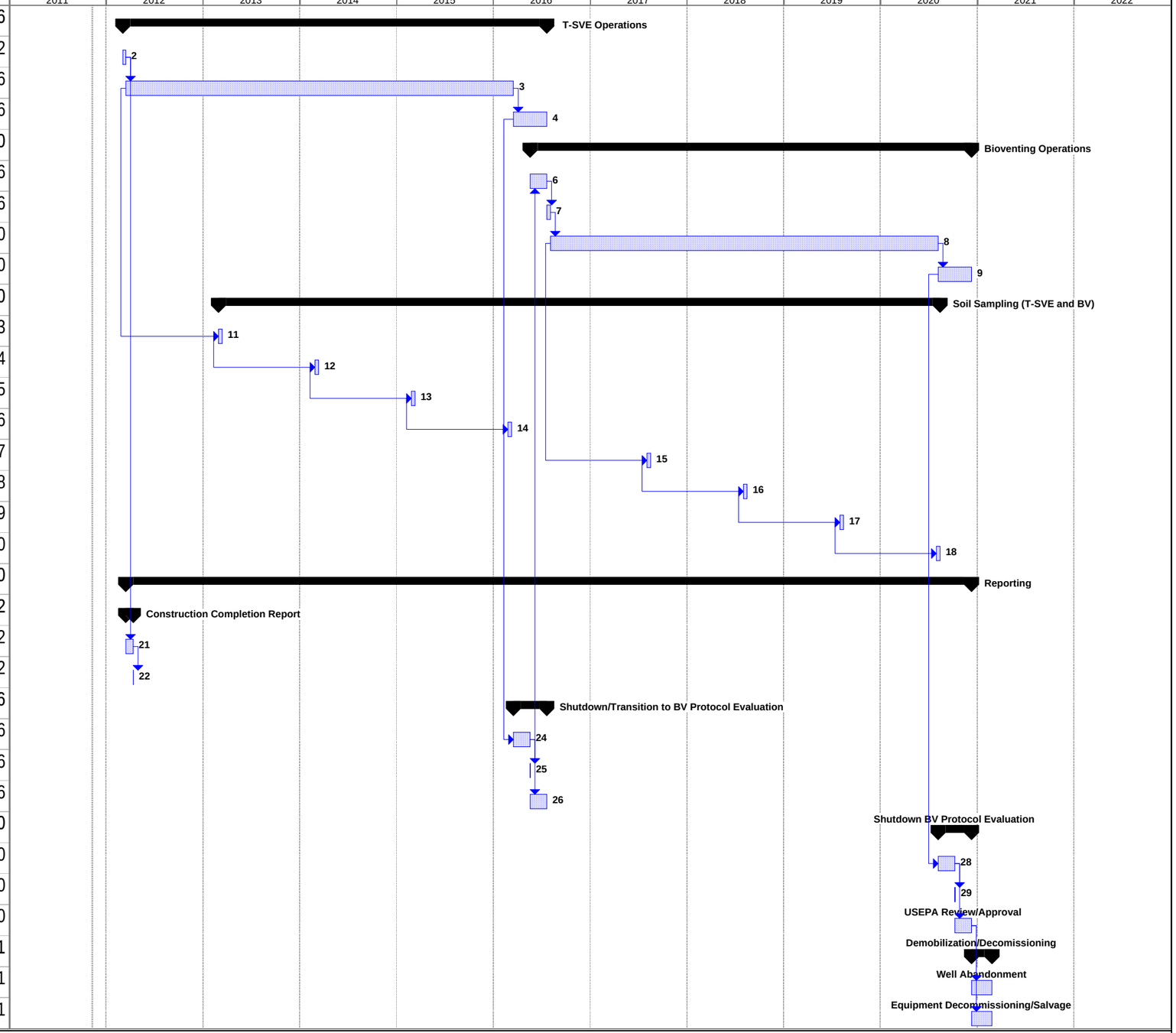


FIGURE 38B
T-SVE/BV OPERATION SCHEDULE
Thermally Enhanced Soil Vapor Extraction (T-SVE) and Bioventing (BV) Treatment
Former Chlorobenzene Process Area (CPA), W.G. Krummrich Facility, Sauget, Illinois

ID	Task Name	Start	Finish
1	T-SVE Operations	Mon 3/5/12	Thu 7/21/16
2	Start-Up	Mon 3/5/12	Thu 3/15/12
3	T-SVE Operation (4 Years)	Fri 3/16/12	Thu 3/17/16
4	Ongoing Operation During Shutdown Evaluation	Fri 3/18/16	Thu 7/21/16
5	Bioventing Operations	Fri 5/20/16	Thu 12/10/20
6	Bioventing Design/Modifications	Fri 5/20/16	Thu 7/21/16
7	Reconfiguration to BV Mode	Fri 7/22/16	Thu 8/4/16
8	BV Operation	Fri 8/5/16	Thu 8/6/20
9	Ongoing Operation During Shutdown Evaluation	Fri 8/7/20	Thu 12/10/20
10	Soil Sampling (T-SVE and BV)	Fri 3/1/13	Thu 8/13/20
11	Soil Sampling (Year 1)	Fri 3/1/13	Thu 3/14/13
12	Soil Sampling (Year 2)	Fri 2/28/14	Thu 3/13/14
13	Soil Sampling (Year 3)	Fri 2/27/15	Thu 3/12/15
14	Soil Sampling (Year 4)	Fri 2/26/16	Thu 3/10/16
15	Soil Sampling (Year 5) For BV Evaluation Only	Fri 8/4/17	Thu 8/17/17
16	Soil Sampling (Year 6) For BV Evaluation Only	Fri 8/3/18	Thu 8/16/18
17	Soil Sampling (Year 7) For BV Evaluation Only	Fri 8/2/19	Thu 8/15/19
18	Soil Sampling (Year 8) For BV Evaluation Only	Fri 7/31/20	Thu 8/13/20
19	Reporting	Fri 3/16/12	Thu 12/10/20
20	Construction Completion Report	Fri 3/16/12	Fri 4/13/12
21	Draft Completion Report	Fri 3/16/12	Thu 4/12/12
22	Submittal to USEPA	Fri 4/13/12	Fri 4/13/12
23	Shutdown/Transition to BV Protocol Evaluation	Fri 3/18/16	Thu 7/21/16
24	Shutdown/Transition to BV Protocol Report	Fri 3/18/16	Thu 5/19/16
25	Submittal to USEPA	Fri 5/20/16	Fri 5/20/16
26	USEPA Review/Approval	Fri 5/20/16	Thu 7/21/16
27	Shutdown BV Protocol Evaluation	Fri 8/7/20	Thu 12/10/20
28	Shutdown BV Protocol Report	Fri 8/7/20	Thu 10/8/20
29	Submittal to USEPA	Fri 10/9/20	Fri 10/9/20
30	USEPA Review/Approval	Fri 10/9/20	Thu 12/10/20
31	Demobilization/Decomissioning	Fri 12/11/20	Thu 2/25/21
32	Well Abandonment	Fri 12/11/20	Thu 2/25/21
33	Equipment Decommissioning/Salvage	Fri 12/11/20	Thu 2/25/21